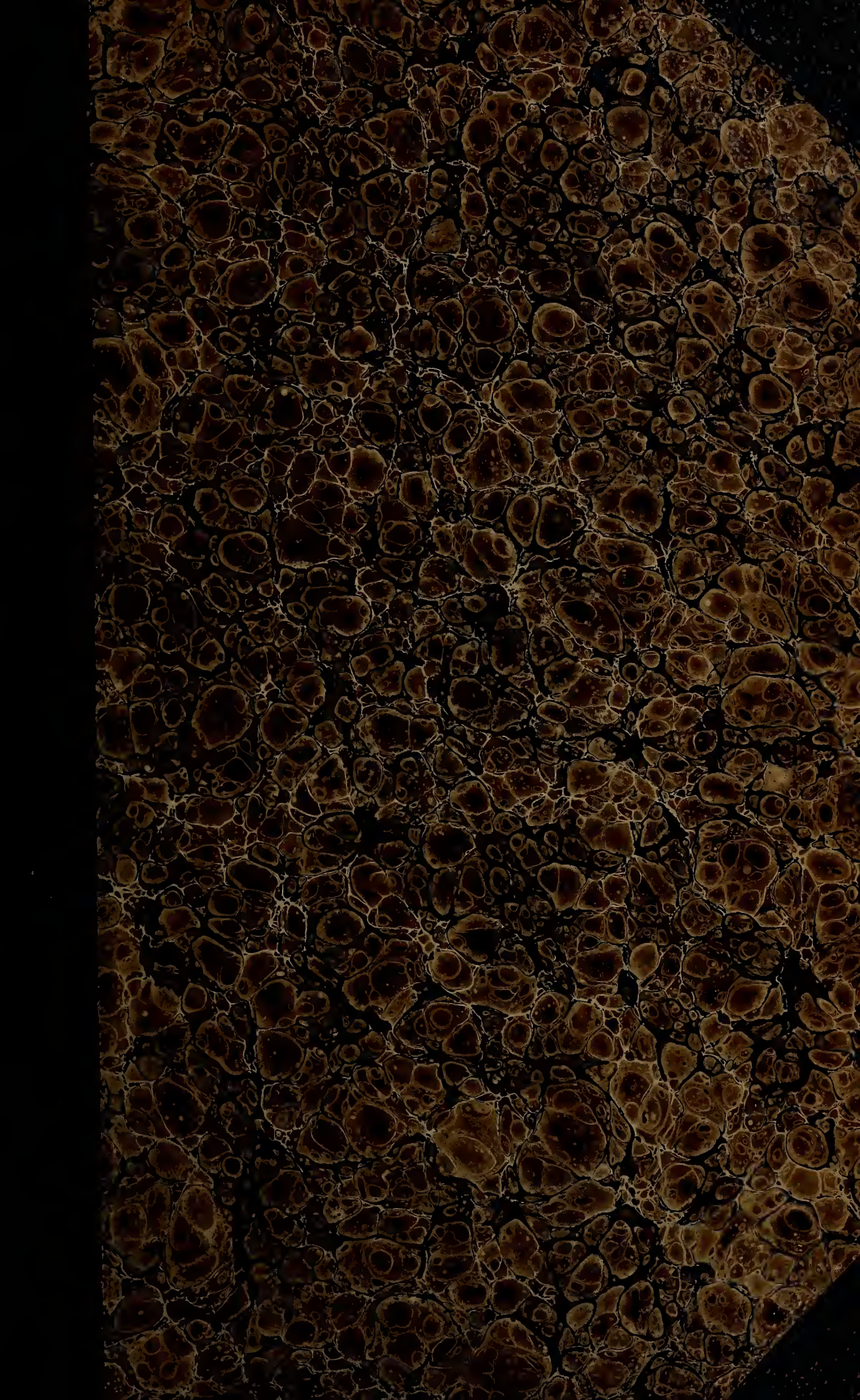
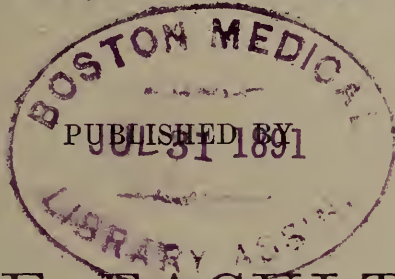




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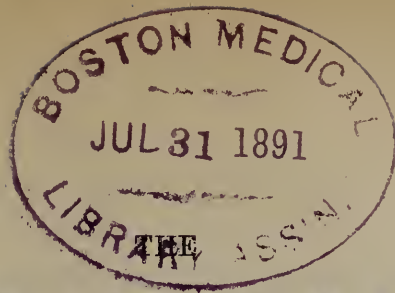
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ON THE EXTRACTION OF TEETH.

BY JOHN M'CALLA, D. D. S.

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The proper treatment of any of the ills which afflict humanity should be the subject of patient and scientific research on the part of every one connected in any way with the healing art. This is no less true of the dental than of the general surgeon. The organs with which he has to deal, are most intimately connected with nerves which throb with the keenest agony in suffering, or thrill with the most delightful sensations of pleasure and enjoyment in health. How skillful, then, should be the hand, and perfect the knowledge of the operator whose field of labor lies so near to the sensorium of the system. We are apt to suppose, in this enlightened age, that a higher point has been attained on the steep declivity of the hill of science, than our predecessors ever reached, and while we admit that rapid strides have been made in this direction, let us not forget the fact, that long before the beginning of the Christian era, the reputation of the Egyptian physicians and surgeons extended throughout the then known world; the monarchs of Persia and other countries for many ages employed them alone. The prevalence of ophthalmia and other diseases of the eyes in these countries, gave medical men ample scope for the exercise of their art, and thus a degree of proficiency was acquired, which caused the Egyptian oculist to be considered the most fitting offering one sovereign could make to another. Dental maladies, on the other hand, were seldom met with in Egypt, and it is to this cause, no doubt, that we may attribute the general silence of authors respecting their proficiency as dentists. It is well known that a carious tooth is seldom to be met with in any of their ancient mummies. Herodotus, the first Greek historian, says, "The art of medicine is so practised in Egypt, that there is found an individual healer for each individual distemper. Hence the

whole country is filled with healers ; some take charge of the disorders of the eyes, others of those of the head, others of those of the *teeth*, others of those of the belly, and others of secret diseases." From the hereditary character of these several offices, we may imagine that a high degree of proficiency would be acquired in the various specialties.

The ancients, we find, were generally opposed to the extraction of teeth, and advise various remedies instead, such as plugging with lead, (plumbing,) plugging with iron, galbanum, wax, the application of the actual cautery, the wearing of charms, &c. When the operation was deemed imperative, a serrated instrument, called by the Greeks rizagra, was first employed to shake or loosen the tooth ; the head of the patient was then placed between the knees of the operator, in order to keep it steady, and should the tooth not come out readily, a kind of hook or lever was inserted under it, on all sides, so as to raise it a little, before again attempting its extraction, when the operation was completed by pulling it perpendicularly. The best received authorities of the day recommend great hesitation and precaution before proceeding to the extraction of teeth.

Coelius condemns the inconsiderate extraction of teeth, and urges, above all things, " that care should be taken in the removal of those that are firmly fixed, as the adjacent parts, particularly the eyes, are always affected by the operation, and frequently it is not only one tooth, but the entire jaw which aches, in such a manner as to render it necessary to extract all the teeth, in order to obtain relief." Another states that when a tooth which is loose or painful is to be extracted, " the nose of the patient should be rubbed with brown sugar and ivy and green oil ; he is advised to hold his breath, a stone is then placed between his teeth, and he is made to close his mouth ; the fluid which causes the pain is then seen to flow from the mouth in such quantity as frequently to fill three pots ; after having cleansed the nose with pure oil, and rinsed the mouth with wine, the tooth is no longer painful, and may be easily extracted. To preserve one's self to a certainty from toothache, it is only necessary, at the return of the swallow in the spring of the year, to repair silently to the border of a clear rivulet, take some of the water in the mouth, and rub the teeth with the forefinger of both hands, and repeat a certain form of words. Another recommends that the roots be anointed with flour and the juice of tithymal, after which the teeth will fall out.

In pursuing the subject of extraction of teeth, allow me to offer a few remarks on the instruments employed for that purpose, both ancient and modern ; note some of the most important improvements, and point out the style of instrument which, from long experience, I have been led to prefer, and, as far as practicable, show the mode of applying them to the teeth to be removed.

Among the first instruments of which we have any account, is the *vulsella*, described by Celsus, about the commencement of the Christian era; it is said to have been a kind of forceps, the beaks resembling the bill of a parrot; this instrument, with slight alterations, came in time to be known as the hawkbill forceps, or *davier* of the French, and in connection with various levers and punches, continued in use for several centuries. The *elevator* next succeeded the forceps, and if we may judge from the description given of the method of using it, we shall be forced to the conviction that the operation of extracting teeth lost none of its terrors by the change. Following this, we have an instrument similar in its action to the key, furnished with claw and fulcrum, but lacking the power and safety of the latter. Among the levers employed, we find the *peid-de-biche*, (hind's foot,) *langue-de-carp*, (carp's tongue,) or *trevelin* of Lecluse, for the extraction of roots: it is a curved lever, terminating in a bayonet point, and was said to be a perfect instrument for the extraction of wisdom teeth, by placing it between it and the second molar. Another, called the lever *a-crochet-et-a-plague*, (the lever with hook and plate,) bears some resemblance to the key, though much inferior to that instrument. The *pelecan*, an instrument formerly much in use, was furnished with a lever, fulcrum and claw, and approximated more closely to the key than any of its predecessors. In the early part of the 18th century, the *key* instrument, invented by Garengot, came into use; the facility of acquiring command of this instrument, and the amount of force it was capable of exerting, soon brought it into general favor, and it must be admitted that where but one instrument could be obtained, none would answer all purposes so well as the key; its defects were sought to be remedied from time to time by the ingenuity of Van Butchell, Spence, Savigny, Duval and a host of others; to the last named gentleman we are indebted for the introduction of the movable fulcrum, one of the most valuable improvements which this instrument has undergone.

To Mr. Cartwright, of London, we are indebted for the first return to the use of the forceps; he so improved them as to enhance very much their efficiency, and about the year 1830 first brought them to public notice; they soon came to be regarded as safer and more reliable than the key. Mr. Snell, taking up the idea of Cartwright, soon followed in the line of improvement, by adapting the beaks to the necks of the different classes of teeth, by means of nibs, grooves and crescents, and added to the better application of the extractive force, by bending one of the handles so as to pass round the hand of the operator, thus preventing the liability of slipping. Dr. J. F. Flagg, of Boston, is entitled to the credit of an improvement in the hawkbill forceps, which consisted in more accurately adapting its form to the necks of the teeth, and at the same time

giving a shape and position to the handles, which would enable the operator to apply the necessary power to greater advantage. A further improvement on Snell's instruments, by Prof. C. A. Harris, consisted in such a change of the handles, as brought the motive power, or hand, nearer on a line with the long axis of the tooth, while the change in the angles and curves enabled the operator to bring the hand nearer to his chest, and under the instrument, thus giving greater command over it, without any loss of power.

Dr. Edward P. Church supplied a want long felt by the profession, in the invention of forceps forming two nearly right angles, above the joint, for the extraction of the superior wisdom teeth.

Dr. J. W. Crane, of New York, invented two pairs of forceps for the extraction of lower molars; one for the first and second, on either side, and the other for the wisdom teeth.

Dr. Hullihen's compound screw forceps, for the extraction of the roots of incisors and canine, in the upper jaw, you are all familiar with.

To Dr. E. Maynard, of Washington, D. C., we are indebted for forceps designed for the removal of the roots of upper molar teeth, before they have become separated from each other; there are two pairs, one for each side of the mouth, and though not often brought into requisition, they are admirably adapted to the class of cases for which they are intended.

Dr. Elliott has furnished an instrument for the extraction of the roots of molar and bicuspid teeth; but of its merits we are not prepared to speak.

The forceps bearing the name of Dr. Physick are found to be very useful in separating the roots of lower molars previous to their removal; they have been highly spoken of by some operators for the extraction of lower wisdom teeth.

John Tomes, of London, claims to have made valuable improvements in tooth forceps.

Mr. Fay and Mr. Mathews, both of England, introduced, some years ago, what was known as the *adjusted forceps*; they were brought to notice by both these gentlemen about the same time, neither being aware of the other's improvement. The advantages possessed by these instruments consist in their anatomical adaptation to the necks and crowns of the several classes of the teeth, and this we regard as a *sine qua non* in the fabrication of dental forceps.

The importance of starting out in the profession with good instruments cannot be over-estimated. With those first adopted we become most familiar from daily association, and while their defects may be numerous and radical, we are sometimes slow to recognize and correct them. I have met with instruments for extracting teeth, in the cases of both physicians and dentists, that would set at defiance all the known laws of

mechanics, and overmatch the ingenuity of the most skillful artisan to adapt them to any useful purpose. Our advice invariably in such cases is, throw them away, put them beyond your reach, and thus reduce the chances of fracture and other unpleasant complications. It is too frequently the case that young beginners procure such instruments as are pointed out to them, or take up those of some one retiring from practice, and seldom or never entertain the idea of improvement. We are happy to say, however, that this is not the rule; valuable improvements have been made from time to time, and the results of a combination of these are now to be found in the hands of a large portion of the operators of the present day. The most important requisites in forceps we conceive to be—1st. A proper adaptation of the beaks to the necks and crowns of the teeth. 2d. The handles should be as near on a line with the longest axis of the tooth as possible, yet sufficiently bent to avoid coming in contact with the opposite jaw. 3d. The length of handle should conform to the hand of the operator; long handles are particularly objectionable. 4th. The handles should be bent in such a manner as to place the operator in the most favorable position in relation to the patient. This is generally conceded to be on the right side, or right and rear. The head is best controlled in this position.

To insure success in the extraction of teeth, a careful diagnosis is of the first importance; an accurate acquaintance with the normal and pathological conditions of the teeth and their surroundings, and a sound judgment in relation to the obstacles to be encountered, is calculated to inspire the operator with a confidence in his own practical abilities, which will enable him to meet the physical indications in each individual case.

Another object to be aimed at is to gain the confidence of the patient. A kind and affable demeanor on the part of the operator, accompanied with candor and firmness, will seldom fail to accomplish this object. All unnecessary display of instruments should be avoided, and the surroundings of such a character as to allay the fearful apprehensions of the weak and timid. These conditions being complied with, we are now prepared to select the instrument best suited to the case in hand.

For the removal of the upper incisors, the instrument most frequently employed has straight beaks, and on a line with the handle, both blades grooved and crescent-shaped at point; to conform to the necks of this class of teeth, the bowl or beaks should be sufficiently separated to admit the crown without pressure, as the object should be to grasp the tooth at or above the neck, in order to secure the best results. It will be found most convenient to have the lower handle bent, to pass round the little finger of the operator; the motion which I have found most effective in the removal of these teeth is the downward, or inward, after a slight

rotary movement; the alveolus being shorter and thinner on the inner side, the attachments are more readily sundered by a motion in this direction. The instrument which I prefer for extracting the upper bicuspid differs from the one just described, in having the beaks narrower, and bent at an angle of about forty degrees, with straight handles; to give the necessary strength to this instrument, we should add to the thickness of the beak what it lacks in width. One instrument answers for both sides of the mouth. The rotary motion is inadmissible in the removal of these teeth, owing to their conformation and position; the outward and inward motions should be given, particularly the latter. The value I set upon this instrument may be estimated, when it is known that I use it for all roots in the upper jaw, after they have become separated from each other, and not unfrequently have extracted all the upper incisors, canine and bicuspid, with it alone.

The upper molar teeth having three roots, two buccal and one palatine, instruments for their extraction should be constructed to meet this anatomical arrangement; hence the necessity for two pairs, right and left, straight handles, and the beaks sufficiently wide to take in all the crown, and bent at an angle of about forty degrees; the point of the inner beak should be curved, so as to embrace closely the palatine root, while the outer one requires a double groove, terminating near the centre in a strong sharp nib. In arresting the tooth, this nib is forced into the depression between the buccal roots, when the inward and outward motion is given, and the organ dislodged. I prefer to have one of the handles curved, as in the incisor instrument.

The forceps previously noticed as the invention of Dr. Church, are well calculated for the extraction of the upper wisdom teeth; the beaks are parallel with the handles, but removed about one inch from the same line by means of two angles above the joint; the points are both crescent-shaped. It is but seldom that we meet with a divergence in the roots of these teeth, hence the nib is not required. This instrument answers equally well for both sides of the mouth.

Passing to the lower jaw, we select an instrument for the removal of the incisors, canine and bicuspid, similar to the one employed for the upper bicuspid, the only difference being in the angle of the beaks, that of the upper being about forty degrees, while the one now under consideration has an angle of sixty degrees at least; the handles straight, and beaks narrow but stout. With this instrument I remove the ten anterior teeth in the lower jaw, and all the roots of lower molars after they have become separated from each other.

For the extraction of the lower molar teeth, one instrument is sufficient for both sides of the mouth. These teeth having two roots, both beaks

of the forceps should be furnished with stout nibs, to penetrate the bifurcation; holding the instrument in the right hand, as if about to use it, and taking the shank, or joint, as the base, we have the handles bent toward the left hand of the operator at an angle of forty degrees, while the beaks present the same angle, in a forward direction, one handle bent around the hand, and the bowl to conform with those previously described. This instrument I regard as decidedly the best I have ever met with for the class of teeth for which it is intended.

For the extraction of the inferior *dens sapientia*, an instrument with straight handles is to be preferred; the beaks slightly narrower than those last named, and bent at an angle of about sixty degrees, both points crescent-shaped; the shank should be as small as is consistent with the required strength, in order to afford a full view of the parts to be operated upon; as the roots of these teeth usually turn back into the ramus of the jaw, to a greater or less extent, it becomes necessary to have other appliances at hand, to meet emergencies. The Physick forceps may occasionally be found useful here. I have not employed them to any considerable extent for this purpose. A stout lever, with angles similar to those of the upper wisdom forceps, will be found very valuable, introduced behind the second molar; the force should be applied to the wisdom tooth in an upward and backward direction, following every movement with the eye, in order to guard against forcing the tooth into the throat of the patient.

Having now described all the instruments necessary for the *ordinary* operations of extraction, let me call your attention to some of those employed for *extraordinary* cases; and first, for the removal of the upper incisor and canine roots, we have the conical screw, compound screw forceps punch and gouge. I have tried them all, but for a number of years past, have depended almost entirely upon my upper root forceps. Where the crowns of upper molars have been broken off, or removed by caries, yet an unbroken connection remains between the roots, I have found the instruments invented by Dr. Maynard to excel all others that I have met with. The upper beak forms a sharp, strong hook, bent in such a manner as to be made to readily pass through the alveolus, taking firm hold above the junction of the roots, while the lower beak is similar to those of the upper molar forceps; the motion is downward or inward, readily wrenching the organ from its attachments; or when the union between the roots is too slight to resist the force, a separation takes place, when they are readily removed by the upper root instrument. Where the same conditions exist in relation to the lower molars, I resort at once to the Physick forceps to separate the roots, and then remove them with the lower root forceps. It is sometimes necessary to extract teeth on account of their irregularity. Where three stand together in a group, it will be

found that narrow, strong beaks are indispensable; the locality of the deviating organ will at once suggest to the mind of the operator the form of instrument best calculated to remove the difficulty.

I have not thought it necessary to occupy your time with any remarks in regard to the extraction of deciduous teeth. I have but one instrument specially devoted to this class; it is a small pair of forceps from the manufactory of Charriere, of Paris. They are the neatest, most convenient, and best adapted forceps I have ever met with, for the removal of deciduous molars; for all other teeth of the first set, I depend upon those already described.

A diversity of opinion exists in regard to the propriety of lancing the gums as a preliminary to extraction. It is contended by some that the attachment of the gum to the neck of a tooth is always but slight, and the extent inconsiderable, and that therefore its severance can have little or no influence in lessening the amount of force required in extraction. Again, it is admitted that there is a difference; that the gums should be separated from the teeth before removal; but for this purpose it is suggested that sharp forceps, driven forcibly into the gums, does the work more thoroughly, and is attended with no more pain than that produced by the lancet. Without stopping to combat these opinions, allow me to say, that I regard the lancet as one of the most important instruments in my case. I do not invariably employ it, but it is my practice to lance well, and I do contend that no timid hand should guide the blade. If the instrument is carefully kept, with a smooth and keen edge, the pain attending its use is inconsiderable, and more than counterbalanced by the increased facilities afforded for the expeditious and safe removal of the offending organ. The common thin, flat handle is liable to turn in the hand; I have found an octagon handle less liable to do so, and much to be preferred.

And now a word as to the relative position of operator and patient. This is a matter concerning which no rules can be laid down. The form of instrument employed controls the operator in a great degree as to the position he assumes. With instruments of the hawkbill variety, the operator is compelled to follow the inclination of the instrument, sometimes on one side of the patient, and sometimes on the other; while with the instruments here described, the operator is never required to leave the right side of the patient, and is thus the better enabled to control the head with his left hand. The only deviation from this rule is in the extraction of the right inferior bicuspid and wisdom tooth, when he turns and faces the patient, though still retaining his position on the right side. Another important point is to have the operating chair neither too high nor too low. In a word, the surroundings must be such as will best

enable us to command the situation ; for this purpose I have two small, separate platforms, each about four inches in height, placed one upon the other, at the back of my chair ; the upper one is easily moved by the foot, and is always ready in time of need. In extracting from the lower jaw, we get upon one or the other of these platforms, as the case may require ; while, in operations in the upper jaw, we remain on the floor, or mount the first platform, if need be. To be able to distinguish promptly the requirements in each case that presents itself, includes not only a thorough knowledge of the buccal cavity in health and disease, but a familiarity with the various forms of instruments, and their modes of action. In this way alone can we acquire that manual dexterity which should ever distinguish the accomplished surgeon.

ON THE DENTAL PULP, ITS TREATMENT WHEN EXPOSED, AND THE BEST MEANS OF PREVENTING EXPOSURE.

BY G. B. M'DONNELL.

[Read before and published by request of the State Dental Society of Pennsylvania.]

The subject of my present remarks, preparatory to its more general discussion by the members of this Society, relates to exposed pulps, the causes of, and the best means of preventing exposure. Who has not had a pulp exposed, and if so, suffered one of the most excruciating pains that mortals can endure and live ? I speak from actual experience in this matter, having had an excavator break through to the pulp in a tooth. Well, I lived through it, and am here to tell the story, but I don't want to try the experiment again, and will do everything in my power to avoid so great a calamity by strict cleanliness of mouth, having my teeth often examined, cavities filled as soon as discovered, in the best manner and with the best materials. In a review of my practice for the last seventeen years, I can well remember the anxious patients, with faces upturned to mine, asking the question, "Is the nerve exposed ?" and then the look of terror when informed that such was the case, for they knew full well what must follow the exposure of a pulp, either extirpation of it, or extraction of the tooth. In view of all these painful considerations, I think I shall be sustained by the profession generally in the assertion that, directly and indirectly, exposed pulps have caused us more trouble, and our patients more pain, than all the other diseases of the teeth combined. The immediate causes of exposed pulps are, decay, fracture and wearing away of the teeth. The more remote causes are, imperfectly developed teeth, the results of imperfect constitutions, made so not unfrequently by the indulgence in improper food, and excesses incidental to civilized life. Well might we as well expect to dip pure water from a stagnant

pool as to have perfect teeth developed from imperfect and diseased constitutions. Like produces like the world over, and the great fundamental preventive for exposed pulps is so to live and regulate our diet and habits as to develop the highest type of being. Then, on the principle of like producing like, we shall have a more perfect growth of tooth substance in all its parts, so hard and dense as to defy all attacks from the destructive agents that come in contact with the teeth. When this condition of systemic purity exists, there will be few or no destructive agents in the mouth to make war on the teeth. The diet should abound with bone-making material. The miller's bolting cloth robs us of three-fourths of the phosphates in our bread, and we give it to lower animals, thus assisting them to have good teeth, whether we have any or not. Cleanliness should exist in the mouth at all times and under all circumstances; neither tartar or food undergoing decomposition and generating destructive acids should ever be allowed a lodgment there. If the foregoing preventives were strictly lived up to, we should not have many pulps exposed. Imperfect teeth, soft and chalky, soon give way to the action of the destructive agents found in the mouth. Decomposing acids are at work separating the lime salts from the animal matter, or *vice versa*, and as fast as they are separated they are washed away, until the pulp becomes exposed. When this occurs, from any cause whatever, the treatment instituted should be conservative, looking toward the saving of that organ and the teeth, if possible. I am aware that there is a large class of the profession who advocate and practice the immediate extirpation of the pulp, and filling the cavity in the root, and argue that, after the development and formation of a tooth, the pulp is no longer of any use, and may be dispensed with, at the same time doubting the practicability of saving pulps by capping with oxychloride of zinc. It is claimed by them that the tooth pulp is of such a peculiar nature, and so susceptible of diseased action, that after it has become affected it cannot be restored to a healthy condition. Facts contradict this theory, as the experience of hundreds of the profession will testify, and show conclusively that they are susceptible of treatment and cure the same as other tissues of the body. The success attending the methods of treating exposed pulps, practiced by many of our best dentists for several years, and by myself for the past three years, is a source of more encouragement than a hundred theories. I am happy to say that the old and barbarous practice of extirpating pulps is surely giving way to the more humane and enlightened one of capping with oxychloride of zinc, thereby preserving them alive. When the pulp of a tooth is but recently exposed, the patient in robust health, the blood pure, I believe that nineteen-twentieths of such pulps can be saved by capping with oxychloride and filling with gold.

There are three classes of pulps, which can, in my opinion, be treated with a fair prospect of saving them. The first, where there is simple exposure; to this I would apply a cap of oxychloride. The second, where the pulp is exposed and wounded so as to bleed; I here apply creasote as an astringent, and cap as in the first case. The third is, where the pulp has become congested and has given pain; here we use means to reduce congestion, and then fill as before. In the past two years I have capped over fifty pulps with oxychloride, and know of only six cases where the pulp has died.

Some of the causes of failure in the use of oxychloride are in consequence of diseased conditions of the blood, or the oxychloride was introduced too hard, causing pressure on the pulp, or the cap was made so thin and soft as to break down under the pressure of the gold used in filling, thereby causing pressure on the pulp, and exposing it to thermal changes, thus inducing one of the most prolific causes of inflammation.

There are those in the profession who say they cannot part with old established practices for new and untried theories, and will cite us to failures with oxychloride, and tell us to wait ten or twenty years and then we shall know more about it. That is just what we propose to do, work and wait, and when they discover something better than oxychloride for the protection of the pulps we will try it. When we want to judge of the merits or demerits of a particular mode of practice or treatment we should look at the rule, and not the exceptions to the rule. The dentist who rides his hobby to the exclusion of to him untried practices or remedies, is very apt to get left in the rear rank of the profession. The world moves onward, and so does the science of dentistry. There is no such thing as driving stakes, and saying, "thus far shalt thou go and no further."

We should be eclectic in our practice, trying all things, and holding fast that which is good. What is good practice to-day may be bad practice to-morrow. Compare the practice of twenty years ago with that of the present time, and it amply proves this assertion. The general practice of destroying tooth pulps is one that should be abolished. Some of the objections to it are, first, it is heroic treatment, requiring more nerve than many patients can bring to their assistance. There is also difficulty in removing all of the pulp from teeth having bifurcated roots. There is gradual wasting away of the investing membranes and gums around the teeth, and the loss of that bright life-like appearance of a living tooth. These are sufficient reasons why a live tooth is better than a dead one.

I find an article in the October number of the *Dental Register*, of 1869, page 443, from the pen of Dr. Taft, who may be considered good autho-

rity, so admirably adapted to this subject that I quote it in full. Dr. Taft says :

“The object of the faithful dentist will ever be to enlarge the sphere of his usefulness, and to accomplish this he must bring to his aid whatever of methods and materials may be made available. The use of os artificial as a covering for exposed pulps has been fully described by some who early employed it for this purpose. The method proposed in this description, and since employed by many in the profession, is simply the covering the orifice of pulp exposure by the os artificial, bringing it in contact with the exposed pulp. In many cases the pulp is so susceptible to the action of the zinc chloride as to take on inflammation, become painful and devitalized, following which will be the usual train of circumstances attending such conditions. Such a result may ordinarily be averted by preventing the contact of the escharotic. This may be accomplished by either of two or three simple methods, first, by placing carefully over the orifice of exposure a small thin piece of Hill’s stopping, or even gutta percha softened by heat, so as thoroughly to protect the pulp from the contact of the zinc chloride.

“A more perfect covering, and one that will certainly occupy all space, may be made by a coating of collodion, or a thick solution of gutta percha and chloroform; this is preferable to the former. A thick covering of the solution is placed over and around the orifice of exposure, and the chloroform may be almost instantly evaporated by throwing into the cavity a jet of warm air. If there is an excess of the covering it may be trimmed off. The cavity, after being perfectly dried by the warm air jet, is ready for the os artificial, which should have as great consistence as the proper manipulation will admit. The cavity in all cases may be completely filled, and if a gold filling is to be made, the os artificial will cut away to the proper point.

“Instead of using the solution for a covering, as suggested, a small pledget of cotton, moistened with carbolic acid, or any other agent indicated, may be placed on the orifice of exposure, and then the cavity filled as before. Another method of protecting the exposed pulp from the action of the zinc chloride is cauterization by nitric acid, after which the os artificial may be directly applied, and will seldom, if ever, cause the slightest pain. Os artificial cannot be relied upon for permanent fillings, except to some extent in certain cases. We regard it, however, as invaluable for the purpose already mentioned. The extent to which the os artificial should be excavated for filling with gold, will be determined by the size and depth of the original cavity. In all cases, however, sufficient excavations should be made to admit of a firmly attached and well adapted filling.

“In a shallow cavity there will be a mere lamina of the primary filling, while in those of greater depth, one-third to two-thirds of the cavity may be filled with it. Os artificial of the best quality only, such as will become very hard, should be used for this purpose. It then affords an excellent foundation for gold filling. We doubt not, that with proper care, as good gold fillings may be made upon a base of this kind as upon dentine itself, providing, always, that the walls of the cavity are of dentine, and are sufficient to guarantee a good support. The os artificial should, in no case, extend to the orifice of the cavity.

“In teeth, the pulps of which are gone, with a large cavity, pulp chambers and canals of roots, all to be filled, may be treated upon the general plan we have indicated, with an assurance of success equal to any other.

“After the most careful preparation of the whole case in the usual manner, the canals in the roots should be filled with gold, then fill the pulp chamber and decayed cavity with the os artificial, then excavate this to the proper extent and fill with gold.

“There are two or three advantages accruing from this method of operating, especially in extreme cases, that are quite apparent upon the mere statement, and the first is where there are living pulps, the ease and facility thus afforded of introducing gold fillings without a possibility of the slightest injury to the pulp. Another is the entire protection of the pulp from thermal changes, thus placing it in as nearly its original condition as it seems possible.

“Again, in those large and very prolonged operations, as heretofore performed with gold only, involving excessive fatigue to both patient and operator, the work, by the method we have suggested, becomes very much less laborious and fatiguing to all concerned.

“It may be said, this is a matter of no consequence; but it is a matter of very great importance when we consider that some of the very best men in our profession have become broken down and worn out by the excessive labor and fatigue involved in prolonged and tedious operations. Our experience in the methods indicated above runs through about four years, with no other indications than those of the most desirable character.”

I will now relate a case of surgery that came under my observation which is applicable to our profession.

Dr. Frank Hamilton, formerly of Buffalo, and more recently of New York, was, at one time, performing an operation for a friend of mine before a class of medical students; the circumstances connected with the case were these: Mr. Moon, the patient, had applied to an eminent sur-

geon of Cleveland to have an operation performed on the os calcis, which had become carious from an injury received from a threshing machine. An examination was made, and the patient was informed that his foot would have to be amputated, as the conditions were such that it could not be saved. The gentleman refused to let him amputate it, but went to Dr. Hamilton, of Buffalo, who, having been informed of the previous decision, made an examination, and as promptly said it could be saved and be as good as ever. On presenting the case to the class he addressed them in these brief but impressive words: "Gentlemen, any *butcher* can cut off a leg, but the true *province* of the surgeon is to save legs." And he did save the limb, and Mr. Moon has it to-day as good as it ever was. Dr. Hamilton's address to his class was short, but it contained truths that I wish were indelibly imprinted on the mind of every surgeon and dentist in the world. To save! save! and not destroy the creations of God, is the province of the true dentist, and, until we do this, we shall fall short of performing our whole duty to God and our fellow men. It made little difference to the first surgeon if Mr. Moon lost his leg, but to him the saving of it was a matter of serious interest. Our relations with our patients are precisely the same. It is of no account to us, personally, if they lose their teeth, for we can, probably, make them false ones—as truly false to every attribute of the natural organs as their name can possibly indicate. But to our patients the matter is different. If we destroy the teeth God has given them, when they could be saved, we have robbed them of organs that we can never replace with rubber and porcelain.

From our experience with os artificial, we have come to the conclusion that ninety pulps out of every hundred, under favorable circumstances, can be saved; and the especial duty of the dentist is to save instead of destroying them. Dr. Atkinson, of New York, says that he never purposely destroys a pulp, and that the dentist is weak or wicked who would do so. In the doctor's opinions I fully concur, for I feel that we as a profession, and I as an individual, have too often been weak and wicked enough to destroy, not only pulps, but teeth, and whole sets of teeth, that might have done their owner's mastication well for years.

And now, gentlemen, if we have been sinners in the past, there is more reason that we make amends in the future, by so regulating our practice toward pulps and teeth that they may live and not die. And my desire is, that perfect dental knowledge and the laws of health may become so well understood and practiced, not only by our profession but by the masses of the people, that the time may soon come when tooth extracting shall be practiced no more.

MECHANICAL DENTISTRY.

BY J. G. TEMPLETON, D. D. S.

[Read before and published by request of the State Dental Society of Pennsylvania.]

The restoration of the organs of mastication by artificial means, comprises by far the greater part of the art implied under the term of "mechanical dentistry," which we have chosen as the subject of a few remarks, in the form of an essay, that may serve as the beginning of a discussion upon a subject forming an important part of our specialty—though much neglected at the present time by many of the best minds in the profession, the consequence of which is, that one particular branch of the science of dentistry has outstripped all the rest in the scale of advancement, while that under consideration has been left, for the most part, to be performed by unskillful and unscrupulous pretenders, calling themselves dentists, who, in some parts of our country are so esteemed by the public, and considered equal to the best men in the dental profession, which is the direct result of a want of knowledge on the part of the masses of the people, as to the proper qualifications of a dentist; hence the mountebank finds a ready market for his stock in trade.

In order to change this state of things, we must not only educate the public mind in regard to the training necessary for the dentist, but we must give to mechanical dentistry that attention which its importance demands, and not allow the wishes or opinions of our patrons to intimidate us from recommending those materials to which the quack is a stranger, and the proper manipulation of which cannot be learned in a few days.

In the discussion of this subject, we shall confine our remarks to the objects to be gained in the insertion of an artificial denture, and the means of its accomplishment; and next, the merits of the different materials that are or have been used as a base for artificial teeth.

And first, the object to be gained other than the mere insertion of an artificial denture, so that it shall suffice the purposes of mastication and articulation, should be the restoration of the features, as near as possible, to that natural expression of countenance of which the patient has been deprived by the loss of the natural organs, and the absorption of the alveoli.

To successfully perform this very important part of mechanical dentistry, the face of each patient must be studied with greater precision than is required of the portrait painter, whose only object is to produce a picture of the face as it is, while the dentist must and is expected to reproduce the face to its original contour, which requires more ingenuity than that exerted by the photographer, who merely catches the shadow of a face, prints it upon paper, and *he* is called an *artist*.

The artistic reproduction of the desired natural expression, is effected by moulding a wax plate upon the plaster model, and trimming so that it shall fill up sunken parts when placed in the mouth, when the expression of the countenance is to be noted, as also the proper length of the teeth required; and if, after thus experimenting, any change is deemed advisable, it can readily be made upon the wax plate, and the effect observed on replacing the wax in the mouth; then, if satisfactory, the bite is taken on the wax plate, from which models are made, on which to arrange and antagonize the teeth in such a manner that they shall correspond in contour to the wax plate.

Having proceeded thus far, the next consideration is, what materials are best adapted to our purpose; then, if the case is a partial set of teeth, we would use a gold plate, upon which we would mount block teeth carved expressly for the case, though in such cases we can usually accomplish all the restoration necessary by using the single teeth, such as are furnished by the manufacturers; and here we take occasion to say, that in no case would we recommend any other material than gold for a partial set; and if our patient was not willing or able to pay for the gold, then would advise the use of a plate of pure silver, alloyed with platinum, as the next best material.

Our reasons for advising these materials for all partial cases are, that they possess greater strength and occupy so much less space in the mouth, and also afford a much better return for the money expended by the patient, being more durable than the so-called cheap materials much used at the present time.

Again, we will suppose that our case is a full set, to be inserted on a gold plate; then the necessary amount of restoration cannot always be effected by using the common, plain or single gum teeth. Such cases are often most beautifully supplied with blocks carved especially for the case, and soldered to the plate, the artistic effect thus being at the will of the operator.

While gold as a base is admirably adapted to the purposes of the artistic or mechanical dentist, yet we cannot award to it the highest place as a base for full upper or under sets of teeth—"the want of cleanliness being a serious objection to its use, which is only imperfectly overcome in the combination of gold and hard rubber."

In "Allen's Continuous Gum Work," we find our ideal almost perfectly attained by its use. A very complete restoration of form and substance can be accomplished, as the porcelain body and enamel can be built upon the platinum plate to any desired shape or degree of fullness; we also get rid of that stiff, regular, artificial appearance of the teeth, as they

can be arranged in any position which the taste or judgment of the operator may suggest, to secure a pleasing expression.

While speaking of continuous gum work, it is with pleasure that we recommend to your favorable notice a modification of the same, by Dr. Moffit, of Harrisburg, Pa., which he offers to the profession under the name of the "Non-sectional Block Work," and free of charge to all who will use it—a degree of magnanimity not usual among inventors of the present day and generation.

In many parts of the country, the porcelain or mineral base is still growing in favor; for strength, beauty and cleanliness, it is not surpassed by any class of work yet introduced to the profession. The natural expression of the mouth, as well as the contour of the face, can be restored by it, as well as with continuous gum work, so justly popular; and, unlike the latter, it can be ground away, if it should be found too full in any place after it is baked, and afterward covered with a coating of gum, that will fuse at a lower heat than the gum previously used.

As a general rule, an upper set can be ground to a cast of the mouth in about the same time that will be required to grind a set of blocks for rubber work. When it comes from the furnace it is ready for the mouth, except the grinding; therefore, there is no filing, stoning, or lathe work required to finish it.

We have been situated where we could observe the success of this class of dentures for the last 12 years, and think, (though, in most cases, in the hands of incompetent men,) it has given good satisfaction to their patients. Being a good conductor of caloric, the mouth keeps as cool and healthy as with gold or continuous gum work, and it is not as heavy as either.

The next and last material which we would recommend for the purposes of restoration, is vulcanized rubber. The ease with which it can be manipulated to obtain the desired result constitutes, in our opinion, the only reason why it should be used; which, in connection with the low price at which it can be obtained, and at which it is served out to the public at large by the many would-be and so-called dentists of the present day—themselves the creature of its introduction—constitutes the main reason for its almost universal adoption as a base for artificial teeth.

One great objection to inserting such a mass of rubber as would often be necessary in restoring contour, is the deleterious effect it has upon the mucous membrane in the mouths of a great many persons, caused by its non-conducting properties. This brings us to the true explanation of the mischief wrought by vulcanite—not because it has failed to sustain the promise of usefulness it first gave, for its merits are such that, for certain important uses, its place cannot be supplied by any other known material; not because of the annoyances of the Goodyear patent agents—although

these are serious enough and have led to much demoralization—but because dentists themselves have failed to recognize the true value of the material, and they have made an incidental quality its prominent advantage, and their real motive for using it, namely, its cheapness.

They have used it thus in that under-bidding of rival practitioners, which is the burning disgrace of dental practice. They have advertised their cheap wares to the world till the community looks upon vulcanite as a material which costs nothing, and think that the work spent upon it has not much more value; whereas, ten years ago they could scarcely overcome a patient's prejudice in favor of gold, now they have so thoroughly demoralized the people that they will not have gold when the necessity of the case requires it.

Were it merely a question of cheapness it would not be so serious, for it is a maxim of political economy, that he is a public benefactor who reduces the cost of articles of necessity; but it is no benefaction when the value is reduced in like proportion, and it becomes an imposture when the value is still more reduced. Cheap dentistry is like dollar stores and gift enterprises—you may possibly get the value of your money, you most probably will not. Now and then a dollar may buy ten dollars' worth, but in the long run the inevitable laws of barter will prevail, and the dollar will only buy the dollar's worth.

There is no more certain law than that cheap work leads to bad work. If proof of this were needed in dentistry, look at the shapeless, inartistic, badly-fitting lumps of rubber stuck over with staring bits of porcelain, which issue from a thousand dental offices—*false teeth*—most appropriately so named; false to every idea of truth, beauty and fitness; made by men false to all proper sense of professional pride and duty; worn by persons false to their own self-respect and dignity, in permitting themselves to be thus disfigured and made ridiculous.

A dentist who is mean enough to get work by underbidding, will be dishonest enough to make it correspond to the price; and this has come to be a common, and, alas! an accepted excuse for not doing what the case requires: "I cannot afford it at the price I get." Hence, cheap dentistry is dishonest dentistry, when the price is such as to prohibit the fullest exercise of skill.

A dentist who works at prices which demand unceasing toil to earn his daily bread, leaves himself no time for mental culture; his work becomes a drudgery, in no respect more elevating than that of a common day laborer. Hence, cheap dentistry is degrading dentistry.

We sum up our charge against vulcanite—or, more correctly, its abuse—in that its cheapness and a certain facility of construction has tended greatly to foster cheap dentistry, and so make the dental art slovenly, dis-

honest and degrading; it has been so used as to lessen the demand for art and skill, and to encourage a community to prefer economy to artistic workmanship.

Let us hope, that when specie payments shall have been resumed in our country, cheap vulcanite work will have breathed its last, and both mercantile and dental worlds have new life infused into them by a return to the old-fashioned GOLD BASIS.

NEW CASTLE, PA.

AMALGAM.

BY CHARLES H. BAGLEY, D. D. S.

(CONCLUDED.)

The loss of health is undoubtedly one of the greatest misfortunes that can befall a man, and he who knowingly does any unnecessary thing which endangers in the slightest degree the health of another, deserves to lose his own. No matter if it has been done ninety-nine times without apparent injury, the risk is always present, and the hundredth time may prove to be the evil time. Moreover, the probabilities are that harm is actually done in many cases which the operator never hears of again, and when even the patients do not know the cause of their sufferings. It is even possible that some who use this material habitually, and almost exclusively, do not desire to know whether any evils result from their operations or not, but say to themselves that "where ignorance is bliss 'tis folly to be wise."

Having considered amalgam with reference to its general constitutional effects, I shall now inquire into the influence it may bring to bear locally on the teeth. When amalgam is present in the mouth, we have all the conditions necessary for the excitement of galvanic action. There are one imperfect and two perfect conductors, a fluid acting unequally on two or more metals. The surfaces acted on are small, to be sure, but they are very near to each other, and the quantity of electricity varies inversely as the square root of the distance. The chemical action of the saliva on the metals is not so vigorous as that of sulphuric acid on zinc, in an ordinary battery, but it has plenty of time in which to work, and with time enough what may not be accomplished, even by feeble powers? The coral insect, in the course of ages, can make islands and continents, as well as the volcanic power of subterranean forces can accomplish the same in a day or week. A drop of water falling the distance of a few feet on the head of a man, causes a trifling sensation, but the same process continued steadily for hours constituted one of the most horrible of the tortures of the Spanish inquisition. A drop of water falling on a

block of granite makes apparently no impression, but "continual dropping weareth away stones" is a proverb. Burdens which, in the morning, seem "trifles light as air," having been carried all day, at night are heavy as lead; and examples might be multiplied. Hence, it is not unreasonable to infer that galvanic action, even though feeble, being once set up by permanent causes in the mouth, important results may follow. Let us see what some of them may be. The integrity of the filling itself may be impaired, when caries of the tooth will naturally follow, for the saliva, or some of its constituents, water among the number, being decomposed, oxygen is set free, and may corrode the metals forming the amalgam. Chlorine is also liberated, and may form chloride of tin or chloride of mercury, both of which are soluble; and, being dissolved, are removed from the filling, leaving it porous and friable, allowing the fluids of the mouth to pass through and around it—the decay of the tooth is inevitable. This action may, however, be partially arrested by the deposition of nearly insoluble oxide or sulphuret of mercury on the surface of the filling.

The teeth are injured by the acids formed by the union of elements set free by galvanic action. All articles of food that are convertible into animal tissue must contain nitrogen, "which, among all the elements, may be called the least decided in its affinities, that which maintains with least tenacity its combinations with other elements. * * Such, indeed, is the instability of animal compounds, arising from these peculiarities, (the presence of nitrogen and water,) that in dead and moist animal matter, no more is requisite for the occurrence of decomposition than the presence of atmospheric air, and a moderate temperature, conditions so commonly present that the decomposition of dead animal bodies appears to be, and is generally called, spontaneous." Keeping this in mind, it is easy to see how a supply of free nitrogen is furnished in the mouth. Not one person in a thousand brushes his teeth after every meal; a still greater number do it only once a day. Multitudes, not thinking that cleanliness is next to godliness, perform this important operation only once a week, before going to church, while the "great unwashed" ignore the tooth-brush altogether. Particles of nitrogenous food being thus allowed to collect around the teeth, are decomposed, and nitrogen is evolved. Nitrogen is also furnished by the albumen in the mucus. The galvanic currents induced by the saliva and amalgam, or these in conjunction with gold fillings in adjacent teeth, decompose the compounds of the saliva, liberating oxygen and hydrogen. The nitrogen and hydrogen having a liking for each other, at once embrace, forming ammonia NH_3 ; but jealous oxygen interferes, the lovers are rudely sundered. Nitric acid NO_5 appears

upon the scene, and immediately commences operations on the tooth structure. The results of his labors at sapping and mining are well known.

By referring back to the analysis of saliva and mucus, it will be seen that chloride of sodium is formed in the former, and the chlorides of sodium and potassium in the latter. The little galvanic battery having been set in motion, the simple compounds of the electrolyte, saliva, are decomposed. Chlorine being divorced from his two wives, sodium and potassium, seeks a new affinity without delay. He finds her in hydrogen, and the twain being made one, forth comes hydrochloric acid, HCl , armed and equipped for destruction.

This acid may be formed in many other ways in the mouth, but they have no connection with the subject of this essay. This, more than any other known acid, is injurious to tooth structure, readily and rapidly decomposing the carbonate and dissolving the phosphate of lime. It should be guarded against by all the means in our power. Instead of doing this many dentists, in defiance of the laws of nature, establish a manufactory of the acid in the mouth, which, having been started, continues running, often until the machinery is worn out.

The galvanic action, set in motion by amalgam, reminds me of the renowned *Dón Quixote de la Mancha*, who, not knowing what he was doing, liberated a gang of galley slaves. The freedmen, by way of showing their gratitude, belabored the valiant knight till he dropped senseless on the ground, and then dispersed to plunder the inhabitants of the neighboring country. Amalgam having started the current, is itself injured while the teeth are destroyed.

It has seemed to me that in my experience in dentistry—not, as yet, very extended—I have met with more cases of periostitis, ending in alveolar abscess, in connection with teeth filled with amalgam, than with teeth in any other condition; and when, as in other cases, a preparation of mercury, if administered in the earlier stages, in the majority of cases seemed to produce a decidedly beneficial effect, in these cases it made no favorable impression whatever, as might be expected if the disturbance was caused by amalgam, for mercury could hardly cure a disease caused by mercury. If the disease was caused by mercury, the latter was probably absorbed through the pores of the tooth. That this is possible, may be inferred from the deep discoloration often found under amalgam fillings, and from the disturbances caused by arsenious acid placed in carious cavities to remove sensitiveness of dentine, or to devitalize the pulp.

There is still another way in which amalgam fillings may indirectly injure the teeth, and that is, by shrinkage. This shrinkage frequently occurs, and the fluids of the mouth then enter between the filling and the

walls of the cavity, are there decomposed, discolor the tooth, and cause caries.

I am willing to admit that, in the majority of cases, we see no constitutional disturbances resulting from the use of amalgam, but the danger is always there, and it seems to me probable that such symptoms may exist without being noticed by the dentist, or, if observed, that they are not assigned to the true cause; the slow and gradual nature of the process assisting to mislead, and, possibly, also, another peculiarity of mercury, concerning which I shall quote the following passage from Dr. Piggot's work on Dental Chemistry: "The dose of mercury which produces its peculiar effects, is well known to be extremely variable. The probability is that, except in rare cases, but a small portion of it ever gets access at any one time into the economy. The effect experienced is not that of the last dose, however large, but of all that has effected a lodgment in the tissues. The recent observations of Melsens and Budd have shown that both *mercury* and *lead*, even in the form of *insoluble salts*, may remain a long while combined, as it were, with the tissues, producing varied phenomena of disease, and then be set free by iodide of potassium, so as to enter the blood, and produce their specific primary effects upon the organization. Now, if these insoluble compounds are capable of producing so much mischief, by what possible process of reasoning can any one arrive at the conclusion that metallic mercury, which we all know to be soluble in the fluids, will prove inert?"

The habitual use of amalgam has a demoralizing effect, engendering laziness and destroying professional pride, just as life in a tropical country, where the necessities of life can be obtained with very little labor, fosters indolence and destroys ambition. When the operator meets with a difficult case he uses amalgam, and the more he does it the more he is inclined to do it, until this laziness becomes a fixed habit. Men easily become slaves to habits, and it is easier to move mountains than to change these same habits. The operator takes no pride in these fillings, because there is nothing in them to be proud of, but little skill being required for their insertion; hence the great carelessness often seen in the use of amalgam, and a frequent cause of failure to protect the teeth. The general result must be a great decrease in skill and professional standing.

I have endeavored to show that, as a general principle, we should not use amalgam for filling teeth when we can avoid it; but there are exceptional cases where it seems to be the only material that can be employed. We sometimes find cavities where it is impossible to insert a satisfactory gold or tin filling—one that will protect the tooth from decay; yet, the tooth is too valuable to be sacrificed. In such cases, it is sometimes well

if the patient can be trusted, to use some temporary filling, as oxy-chloride of zinc, and renew it when necessary. If this cannot be done, we must choose between two evils: either to lose the tooth or use amalgam. I think we should be justified in doing the latter, and taking the risk; but can think of no other case in which it would be proper to do so.

When we undertake difficult operations, and are wearied or unwell, the temptation is strong to use amalgam, avoiding the obstacles in our way, instead of grappling with and overcoming them. At such times we have opportunity to prove our steadfastness and resolution, to our own satisfaction at least; for no man can be sure that he possesses virtue until he has withstood temptation, no more than he can know that he is not a coward until he has met danger face to face.

"Every science has its difficulties," and dentistry is no exception to the rule; if it was, it would not be worth much; for the road to knowledge and skill is as narrow and difficult as the path to virtue. "Do what you ought, happen what may," is a Dutch maxim, applicable to this case.

We should, then, continue to work on with the best means at hand, despite the difficulties in the way, hoping that at some future time a substance may be discovered which shall combine the excellent properties of gold with the plasticity of amalgam, without the undesirable peculiarities of either, but possessed of attributes which exist in neither. "It is a consummation devoutly to be wished for." It may not come to light in our lifetime, but some future generation may find it and enjoy it; for, says Hippocrates—

"Life is short, and Art is long;
Occasion fleeting; Experience fallacious,
And Judgment difficult."

Many a failure and disappointment will be met with, but I doubt not success will come at last. Meantime we have that excellent material, gold, and when it is too expensive, tin, with which we can exercise our skill, and furnish respectable protectors of the teeth,—surely much better than a set of rowdies fighting together in the dark; for it is a true, if trite saying, that "Evil communications corrupt good manners;" and tin, a placable and well-behaved character, when alone, if brought in contact with mercury and other metals in amalgam, only helps to make confusion worse confounded. Where simple tin will serve our purpose so well, if we add to it mercury, we shall surely have one of those cases where even a *little* more than a little is much too much; for, as Sir Isaac Newton says: "More is in vain when less will serve; for Nature is pleased with simplicity." *Simplex munditus* is an excellent motto, and especially applicable to gold as a material for filling teeth.

ASSOCIATION AS AN ELEMENT OF IMPROVEMENT.

BY SAMUEL WELCHENS, D. D. S.

[A public Address, delivered before the citizens of Pittsburg. Published by request of State Dental Society of Pennsylvania.]

In no age of the world has there been so much attention paid to the formation of associations for mutual benefit and improvement as the present.

History is so blurred and blotted with the iron rule of despotism that the very instincts of man lead him to prefer habits of isolation and selfishness, rather as a medium of protection from the persecutions and inhumanities of the rulers, in those earlier days, than to claim the benefits of society where so much jealousy and oppression seemed to be the controlling element, and where the social attributes of the home circle, in many instances, proved to be a certain passport to the block, or the torture rack of the inquisition.

The tyranny of public sentiment, the dark designing prerogatives of government, and the superstitions and cruel infatuations of the church, have each, in turn, so emulated one another, in deeds of cruelty and oppression, that the individual in those days must have been bold, indeed, to have so far disregarded the principles and tendencies of either, as even to contemplate a movement towards fraternal intercourse within their borders.

There is, perhaps, no better settled principle in history than the quickening, jostling, progressive energy, awakened by those *associations*; and this alone, when the very outposts of despotism rested essentially upon the ignorance of the people, was enough to call down upon the very idea of such improvement the anathemas and oppression of institutions which could not live a moment, except upon the scattered fragments of society and the bonds of ignorance and superstition.

Association, unity and harmony, have ever proved a most formidable bulwark to civil and religious liberty, and that expansive development of scientific and intellectual improvement, which has raised the world from heathenish darkness into the broad, open sunlight of progressive development.

Powers and principalities, therefore, as well as the moral and intellectual status of society, are alike influenced by this balancing and improving element. The asperities and anarchies in governments rarely disturb the evil purposes of the despot; but the *association* of his subjects for improvement and culture strips him of his regal robes, and makes him tremble on his throne.

The very occasion which gathers a people together gives character and expression to their actions, but the achievements and results of their

councils gain strength and power in proportion to the energy they exercise in their deliberations. Patriotic hearts, assembled to solemnize the day on which their freedom was announced, are bound together in mutual sympathy, and with heads erect in the proud consciousness of equal rights, the air swells with the loud acclaim of their joyous voices, as they repeat, in stirring accents, the immutable truth that man was born to be free. But it is in their *associated sympathy* that the compact is sealed, and that the transaction is characterized with the forces and powers of perpetuity.

All this accords well with "the eternal fitness of things," for there is a law in the economy of nature which subordinates every species of growth and improvement to the element of dependency.

No principle is more palpable, and no power more effective in its complete conformity to that rule of life that makes one object active and energetic, and another slothful and negative. It runs through all the relations of nature with a talismanic influence, and harmonizes all discrepancies, smooths all disparities, and gives an earnest, positive, progressive energy to every interest, whether utilitarian, scientific, civil or religious.

Association consolidates, establishes, renovates, sharpens, sustains and develops every business enterprise, pursuit or profession, and every scheme of a moral or religious character that seeks its stimulating and renovating power. With it, the race of mankind is at once raised to dignity and prosperity; without it, selfishness, discord and anarchy rend asunder the proud fabric of human enterprise, and as the planets of the solar system, deprived of the forces which keep them in their respective orbits, would break away into wandering meteors, so would the social system crumble into withering fragments, and fly off into isolated selfish particles, as scintillations are emitted from the consuming metal. It is to the intellectual world what the law of gravitation is to the physical, and no other instrumentality can so develop the finer and higher qualities of the mind, as the comparison and interchanging of views and ideas. "As steel sharpeneth steel, so the countenance of man sharpeneth that of his brother."

If we analyze the fertilizing influence of the spirit of those associations, and contrast its virtues with the sordid elements of abstract individualism, we will see at once how largely it enters into all the relations of life, and how happily its results compare with the repellent characteristics of selfishness.

In a scientific point of view this law of dependency or association is of paramount significance. Chemistry, electricity, the laws of gravitation and cohesion, the conditions of growth in vegetation, and all the laws of affinity, by which separate and distinct elements are brought together to form systems and construct fabrics, rest essentially upon it.

A chemical compound, for instance, is composed of two or more elements, and as such it is capable of acting in *itself* as an element in many of its

combinations. But without the association of those elements there could be no chemical change or equivalents, and the science would fall as a dead letter by reason of its incompetency.

A germ contains all the principles necessary to develop the towering oak; but this principle of dependency upon correlative agencies, calls into action moisture, heat, light and the gases of the atmosphere as essential conditions of vegetation, without which there could be no growth, and the germ would remain forever but a particle of inert and worthless matter.

The solar system is composed of myriads of worlds and planets, with no special sympathy or affinity with each other, and if destitute of correlative forces, or if influenced solely by abstract repellent isolations, they would wander in the immensity of space, and destroy each other by forceable contact, or terrible explosions, occasioned by the approximation of volatile and heterogeneous gases. But by the *association* of the law of gravitation, with the elementary and chemical equivalents of the atmosphere, and the centripetal and centrifugal forces, each planet is held in its respective orbit, systems revolve around systems in perfect harmony, and this order of the universe becomes another important witness to the efficacy of association in every department of nature.

No structure, whether organic or artistic, can attain to any degree of usefulness or perfection without it; and all through the labyrinths of professional science and historical research, in government, in moral and physical culture, or even the minor details of life, no great or brilliant results have ever been achieved where the power and efficacy of *association* have been ignored.

Even the language, habits and movements of individuals are influenced by it, and are fraught with happy, graceful results, or awkward, halting, slothful characteristics, just in proportion to their facilities for associated intercourse with kindred spirits.

Education is but a systematizing of the faculties and powers of the mind, so as to enable it the more readily to grasp and analyze the great problems of life as they present themselves in varied forms before us. But no system of education could ever prove to be successful in the accomplishment of such ends, if it were founded upon abstruse and isolated abstractions. The finer and purer and more useful triumphs of science are the true component elements of education. But they are strengthened and sharpened and established alone through the stimulating energies of *association*.

My object is to apply this philosophy to the formation and workings of association, in the development of the learned professions, and more especially to that of *dentistry*.

In all the essential requisitions of improvement in any profession, these

societies have a leading and powerful influence. It is not only in scientific culture that improvement is felt, but the *social* benefits are of incalculable value.

If the interests and dignity of a profession are to be advanced, and its standard of excellence elevated, it is most important that a laudable emulation be encouraged among its members to incite them to earnest inquiry and a progressive individual energy. *These* are the elements of improvement and success, but they have no fellowship—no growing affinity with the characteristic attributes of a mean *prejudice*.

If they are to have a free untrammelled exercise of their powers, the corrupting influence of *jealous nature* dare not contaminate the soil designed for their propagation. But a cordial cultivation of the higher powers of the mind, and the nobler impulses of the heart, through an intimate acquaintance and friendship of the members of our craft, one with another, as is the tendency of those societies, is the surest method of propitiating those baser and sinister tendencies, and of opening the way to dignity and manhood.

The first step toward such a movement—the mere desire to unite in such an enterprise—is of itself the exercise of an energy in the direction of that noble endowment of the heart, which does not only make us better members of our *profession*, but better citizens and more useful members of society.

Those petty jealousies and disreputable business prejudices which enter so largely into every community, and become so baneful in almost every business enterprise, are nowhere so reprehensible as among members of the same profession, especially those who hold positions of respectability.

They retard the progress of intellectual and scientific improvement, and destroy every incentive to research and discovery, thus losing to their profession the acumen of their minds and experience, which, if under better discipline and a more hopeful influence, might add honor to themselves, and useful and brilliant acquisitions to their vocation. To nurse and indulge such a spirit is the most certain way to destroy a man's influence for good; for it renders him morose, sullen, designing and selfish, with no good word for any one and no praise, save for himself.

Instead of those higher qualities of his being, of which we have just been speaking, sordid avarice takes possession of his life, and improvement, that should flow from his participation in any scheme or compact of social intercourse with his neighbor, is nowhere to be found.

Such men are sometimes found in the liberal professions; but they are rarely seen in associations formed for the advancement and improvement of such profession. If they come in at all it is to obtain position, or to have some honor thrust upon them, which they had not genius or energy to call forth themselves. Disappoint them in this, or fail to make leaders of them, and they again retire into their wanton, *slothful* and *selfish habits*.

Contrast the life of such a narrow-minded, hide-bound individual, with the full, free, open expanse of a being whose life and habits have been trained in the school of fraternal intercourse. One who enters a profession to reflect honor and credit upon it, and who comes into every measure designed to prove his love for his calling, and a mutual benefit to both, and the advantages of those associations stand out in bold relief.

He is thus qualified to meet his patrons, not only in the routine of scientific competency, but as a *conscious gentleman*, *easy* and *affable* in his manner, *sympathetic* and *tender* in his *bearing*, with more of a desire to do them good than to get their money, and he will meet both the requirements of his profession, and the wants of the public in such a manner as to insure him a useful and brilliant career.

We will now turn to a contemplation of the real substantial benefits of those societies in a scientific point of view.

Professions are not made, they grow. They are either adventitious buds from some parent stem or trunk, or they are regular growths from germs lodged in the rich prolific soil of science.

They are thus creatures of circumstances and conditions, and require nutrition of a substantial character to secure their development, just as much as the growth of a vital organism would. A profession cannot live upon abstract theories and isolated dogmas. There must be an orderly and progressive exercise of the elements of growth and improvement, in order to establish an energetic and *hopeful status*.

Dentistry, though a branch of the healing art, is, nevertheless, a profession of legitimate birth. It was practiced as a distinct branch of surgery by the *Egyptians* as far back as 1200 years before the *Christian era*, and the complications of the teeth with the adjacent parts—their important position and the character of their function as organs of the highest type of structure, gave it as a separate branch of surgery the very highest position in the role of professions as then practiced.

Like other objects of growth, *dentistry* may be said to have three several stages of development. The first we will designate as that of *infancy*. The second of *youth or pupilage*; and the third, (though in a comparative sense,) that of *maturity*.

We characterize the remote history of our profession as an infantile stage, because, in being confronted with the stern realities of diseased and aching teeth, the ancients, in their remedies for those “distempers,” as they styled them, exercised far more superstitious quackery, which seemed to be the result of ignorance and inexperience, than scientific, or even common judgment, in which an advanced stage of development might be evinced.

The malady then, as now, was, no doubt, as *excruciatingly mature*; but

the remedy, either as medical or surgical, was of that order as to stamp it with the *imbecility of infancy*.

Genius and correct *scientific theories* were not wanting in those days; but the prevailing superstitions led to the most ridiculous expedients, and true skill and science, (which are always modest,) were kept, to some extent, at least, in the back ground.

There were then, as now, two elements striving for the mastery. The one was the honest promptings of the true devotee of *science*; while the other reveled in an atmosphere of quackery, and taking hold of the crude ideas of the people, *the latter* has always been the most successful.

The faint glimmering of science in those, say: "I know well that many believe there is no better remedy for toothache than extraction; but before proceeding to that there are many other remedies that may be successfully employed. It is not necessary to proceed at once to extraction, even though caries exist, for, by removing the decayed portion of the tooth with a sharp cutting instrument, such removal causing no pain, whatever remains is as sound as a perfect or healthy tooth."

Quackery was equally solicitous about retaining the tooth, probably on account of their inability to extract them, but less scrupulous in its restoration to health.

Accordingly, there were amulets and other superstitious means employed to allay the pain; and not unfrequently such ridiculous notions as the following would be entertained and resorted to, as expedients, for the want of better theories by which to humbug the people. "The tooth will drop out by itself if it be rubbed with *African sponge*, but care must be taken not to meddle with a tooth which is healthy."

The aversion to the extraction of the teeth gave rise to many curious expedients to get round a most difficult and dangerous task, and accordingly they resorted to the actual cautery, in the use of hot iron and brass needles, and hot oil and butter to destroy the pulps of painful teeth, and "numerous caustic medicines, the intended effect of which was to make the teeth exfoliate," and thus they would destroy them rather than extract them.

Teeth were filled, too, with lead in those days, but the object seemed more for the purpose of strengthening them for the operation of extraction than to preserve them from further decay. For stopping them when carious, a sort of gum was used, or the decayed part was scooped out with a common scalpel. This sort of treatment was in vogue in the days of *Celsus*, who flourished about the commencement of the *Christian era*.

This slow progress in the healing art, from the time of *Æsculapius* to the days of *Celsus*, a space of about 1200 years, shows the scientific animus of those earlier years, and is a fitting commentary upon the *virtue*

and power of colleges and professional societies to carry forward and upward that matchless development which has characterized the present age, and the *latter-day glory of the scientific world*.

At a still later date we have accounts of artificial teeth being set on wire, and carved out of ivory, but to what extent this practice was carried we are not informed.

The history of those ages is but a catalogue of this kind of practice, more or less ridiculous, and alternating between the devotees of science, even in its incipiency, and the crude notions of the ignorant and superstitious mountebanks, who seemed to be about as plentiful *then* as *now*.

This, then, faintly shadowed forth, is a glance at the infantile stage of our profession, and may be regarded as reaching, in this fashion, down to the beginning of the last century.

“In the year 1700 persons destined for the profession of dentistry were compelled, in France, to undergo a regular examination. It is from this period, perhaps, that we must date the establishment, in modern times, of the dental art, as a *distinct branch* of medical practice;” and from this time forth its pupilage may be regarded as in vigorous and successful operation.

We have neither time nor space to dwell upon this part of our subject. It is not important that we should, but the superstitions of the ancients, and this narrow, time-serving jealousy, of which we have already spoken, seems to have been inborn elements with those who presumed to practice in a profession which has always been too lenient and too easy of access. *Accordingly*, it is not beyond the recollection of some of our oldest practitioners, when this spirit still reigned supreme, and for a man of ordinary intelligence and genteel address to enter a dental office, would usually produce considerable commotion. There would be as much nervous perturbation and smiting together of the knees upon the part of the operator as that of the patient.

The latter would quake and tremble for fear of the jaw-breaking operation of extracting a tooth; whilst the former would tremble and quake, lest the latter would *steal the business*.

There was thus any amount of jerking, dodging and rapid nervous concealment of instruments and appliances, lest quacks should spring up, and, by their bungling work, cheat the people out of *money and teeth both*.

If one of those characters chanced to discover a *new thing*, whether forceps or file, or excavator, hand-mirror, chair, or even *tooth powder*, he would straightway get a *patent* for it, and *woe* to the *infringer thereof*. The indignities and anathemas of the whole civil code would descend upon his devoted head, with a certainty and severity which would put to the blush the *prettiest efforts of old Josiah*.

They also exercised a commendable *solicitude*, not only for the *protection*

of their *patients* against bad work, but against exorbitant charges also ; and lest the *dear people* would, in some way, be *cheated*, they would *insure their work*, or *give it out on trial*, and emulate each other in establishing *starvation prices*. Some of these habits, I am sorry to say, have followed the profession even into maturity.

As the youth grows and his mind expands, so the *profession has grown*, despite the efforts of some of its slothful and unprincipled members to drag it to the earth, in endeavoring to make it subservient to their own *aggrandizement*.

Its final stage of development, however, may be gathered up in the present advanced condition of these two ideas, namely : The course of study necessary to a complete dental education, as demanded by the scientific spirit of the present age. The second is that high-toned *social code* which is more directly developed by those *associations*.

These combinations draw in every element of improvement. Instruction in the private office should be directed with a view to a thorough and complete collegiate course ; and the instruction there should again be followed and established by the discussion of social and scientific benefits of our *local, State and National societies*.

There are here facilities for every species of instruction and information, and he must be a *drone indeed*, who does not grasp the helping hand which is thus stretched out to render such important service upon such *easy terms*.

Another most important element in this process of improvement is a substantial and efficient *literature*. Where a disposition to improve in a literary culture is wanting, a high-toned standard of excellence cannot be attained. No practitioner, however well his mechanical manipulations may be performed, should be recognized as such, unless careful attention be paid to such study and research as will keep him up with the progressive spirit of his profession. If he stops reading, or *ceases* to be a student, *then should he also stop practising*.

This is the life *and light* of the scientific element in any profession, and for a drone to steal in and bring disgrace upon his calling by a criminal imbecility, as the result of an ignorance superinduced by indolent habits, is an outrage, not only upon the profession, but the community at large ; and mal-practice, arising from such pretensions, should be subject to *severe legal prosecution*.

The idea, then, of a *mature profession* is not to *cut off* all the resources of development and progression, but so to *arrange and harmonize* them as to make them more *efficient*.

It is so to use and handle the appliances to which I have averted, (and the most potential of which I contend to be those societies,) as to fortify all the weak points and outposts of our profession, that it may prove to

be our *castle*, finished and complete, towering above and beyond the *prejudices* and *jealousies* of the world of selfish business interests, and the floundering blunders of *professional charlatans*.

THE STATE DENTAL SOCIETY OF PENNSYLVANIA

Was organized under most favorable auspices, in the City of Philadelphia, in the early part of December, 1868; this being its second annual meeting.

The formation of this association should be regarded as complimentary, both to the profession at large and the people of this great Commonwealth.

It is certainly a source of commendation and congratulation to every man who loves his profession to know that it contains vitality enough to develop such promising evidences of prosperity.

The movement was not set on foot for selfish purposes or individual pre-ferment. There were no dreams of future greatness being *thrust* upon any one who was not perfectly competent to bear such distinction, or willing to receive it.

The idea that it was to be formed in the interest of one local society in preference to another, or to the advancement of the reputation of one of its members over the worthy claims and aspirations of another, did not enter the mind of any of its founders. It was not intended that *Pittsburg* should be preferred to *Philadelphia*, or that *Erie* should claim more prominence than *Lancaster*, or that *Harrisburg* or *Reading* should present better and stronger claims than *Williamsport* or *Chambersburg* in the dispensation of its benefits. The material of which it was composed, and the spirit by which it was animated, were a little too independent to be *ruled* by one section of the *State*, or *ruined* by *another*. It is thus composed of that kind of material that rarely succumbs to ordinary trials, and *never cowers* at the *frowns* or *ridicules* of self-constituted dignitaries.

We say its organization was not prompted by any such sinister motives. It was not forced into existence by a few narrow-minded individuals, whose *aims* and *ends* were to establish a *central oligarchy*, whereby the sovereign character of our profession should be destroyed, or any local society or individual interest be subservient to a *focalization of power*.

But it *was* the result of an *open generous outburst* of the progressive energies of a profession which was *big* with the spirit and enterprise of the age; and the vitality which it has displayed, from the beginning, is the very best evidence that it was *born to live*.

The positive attributes of this *State society* are, that it was formed for the scientific and social advancement and benefit of every member of the dental profession throughout this *broad Commonwealth*. It was intended to draw together the best material and the best energies of the profession, thereby to constitute a *nucleus* to which other good material would gravi-

tate, and thus establish a status, not only upon a higher scientific *basis*, but upon surer and better moral and social principles than obtained heretofore.

It was thought that such efforts would be appreciated by those high up in the scale of honor and learning, and be commended and sought after by those who are striving for reputation and advancement in their professional pursuits.

The proposition being fair and honest, and honorable and beneficial to all, no one dreamed of a formidable opposition or of serious objection, especially among those who were well informed in regard to those redeeming qualities. This social and scientific compact was entered into by the best talent and some of the best men to be found in the State. With such antecedents, and the endowment of such energy as might reasonably be presumed to be thrown into the enterprise, we expect not only that the *State Dental Society* will prove to be a *success*, but that it will be a triumphant vindication of all that we have said about the benefits of those *societies*.

But the *people* have an interest in this matter. If we confine all the benefits of those associations to the members of our *profession*, we would defeat the main object of our argument. The improvement thus developed *concentrates* the energies of the profession, but it is to render more efficient service to those who require it. If a man embarks in a vocation, which so nearly concerns the health and comfort of the people of his community, it is not only his duty to avail himself of every source of information, and every appliance necessary to carry out successfully the pretensions of his craft, but it is the moral duty of the individual members of that community to not only countenance and encourage such schemes of improvement, *but they should demand* either the preparation and competency which he may obtain from every approved source of information, or his *retirement* from *practice*.

Now, my friends, if there is any one thing more despicable than another upon this broad earth, it is a *quack community*; quack *dentists*, quack *doctors*, quack *lawyers*, quack *teachers* and quack *statesmen* are plentiful enough everywhere, and *bad enough* in all conscience; *but a quack community* outstrips them all. I do not mean a community of quacks; such a thing is scarcely possible, since they are unable to live upon each other; *but a quack community*, a community of average intelligence and ordinary business qualification, that will submit to the jaw-breaking operations of an *ignorant* and *bungling dentist*; the life endangering practice of an *incompetent* and *self-conceited physician*; the ridiculous council of a *poor half-bred lawyer*; the feeble efforts of an *empty-pated teacher*, and the *dark designing chicanery* of a *mountebank statesman*, day after day, and

year after year, with no effort to throw off the *incubus*. This is what we conceive to be a *quack community*.

Why a system of fraud and quackery should be supported by any class of people is a question entirely beyond our comprehension. How it is that the natural bias of the public mind seems to gravitate to deception and humbuggery, rather than a proper appreciation of the scientific, the noble and the good, we cannot explain. Certain it is that there *are* antagonisms, and to reconcile them, especially in dentistry, is the object of the formation of our societies.

All that is necessary, to be guided properly, is, to seek information from reliable sources, what your doctor's *standing is in his profession*. A dentist or a physician may deceive the people, but he rarely humbugs the solid mind of his *profession* long. Nor is his diploma a sure test of his competency. Those who are graduates of colleges are not at all times our best operators. This, of course, is a leading qualification, but some of the greatest *churlatans* in the profession hold diplomas, and though good as a general rule, those diplomas are dangerous things in the hands of men who will *abuse* the license they bestow upon them.

It is not there *alone* that the profession looks in making up the estimate of a man's qualification to practice. It is his *faculty*, his *judgment* and his *genius*, and the moral bearing and attributes of character, *after* the advantages of a liberal professional education, which make up the totality of his *passport* to the higher and better judgment of his professional brethren; and *just here* he generally must come to become a member of those societies.

An out-and-out quack scarcely ever gets into our societies, and consequently a membership therein should be one of the *very best passports* to your *confidence and support*.

In the next place, note his standing in society. He may be a little *gassy* and *conceited*, (some of our best men are so,) but he must be *sober* and *solid*. The *brain* must be clear and the *hand* steady that wields an instrument or that compounds a prescription, or the individual that would presume to render you medical or surgical aid when in distress should be entirely *unworthy your confidence*.

Now, why should there *not* be a grand simultaneous movement of the dental profession throughout this *State*, and, indeed, throughout the country, toward a higher, more concentrated and more efficient standard of usefulness? Similar efforts are being made in every other department and enterprise in life; and that branch of the *arts* and of *science* that loiters, or shows itself to be a *laggard*, is unworthy of the age, and *ought to go down!*

Some years ago, at a literary entertainment, a distinguished scholar characterized Pennsylvania as a *sleeping giant*. He had reference, prin-

ipally and especially, to the cause of education. But in this, as well as in every other particular, it was a happy *simile*.

If we contemplate, for a moment, the various interests and the latent energies of this vast commonwealth, the force and power of the comparison will at once be apparent.

It is not only the mental powers in the educational interests of this *huge giant* which are dispelling the mists and drowsy scales from eyes and activities long *closed in slumber*, but its matchless resources in its *mineral, agricultural and commercial* features are being not only aroused, but developed into physical proportions, not only as a structure for its mental endowment, or as a peer among *other states*, but as a *veritable giant*, towering head and shoulders *above them all*.

Anatomically considered, the caricature is still more striking. Its mineral bones, its iron muscles and nerves of steel, and an epidermis of the verdure and rich soil of the earth, and wells of oil belching forth from its very bowels, attest the vigor of its heart of enterprise. Then see the rippling grandeur of its circulating system, in its majestic rivers, its numerous creeks and rills, and meandering streamlets, and the herculean labor of its hand in its railroads, canals and navigations, and engines of locomotion. All these present a physiological fabric well calculated to receive and develop the higher attributes of education, and a cultivation of the arts and sciences.

It is being beautified, too, is this sleeping giant, in its splendid cities, beautiful towns and hamlets, and gorgeous palaces, and the living green and foliage that covers its broad acres and towering hill tops; and the moving mass of living, working, justling beings that swarm every foot of its soil, is indubitable evidence of its being a *thing of life*.

To show the high character and nature of this giant organization; it is not like the brute, either *granivorous* or *carnivorous*, but, like man, it is *both*; for in its repast it does not stop with the immense loads of its vegetable and agricultural products, but the "cattle on a thousand hills" are daily victims to its insatiable appetite.

Now, if there are societies, corporations and promiscuous gatherings in the interest of every other enterprise that caters to the taste, appetite and development of this giant, why should not dentistry take position side by side with the best of them? If, by the concentration of those interests, every part and feature is improved and sharpened, *why not sharpen the teeth also?*

If this idea is correct, and *that giant* is properly aroused, with an appetite sharpened by the slumber of a century, and you furnish his repast as above indicated, you will call down the anathemas of his vengeance if you do not furnish him with a good *healthy and efficient set of grinders*.

A CASE OF INTEREST.

BY A. J. REDERICH, D. D. S.

The subject, a lady about forty years of age, came to have a wisdom tooth extracted. On examination, the buccal surface was found decayed much below the margin of the gums, which projected in and nearly filled the whole cavity.

After cutting sufficiently, the tooth was grasped and extracted, which was done easily. After laying it aside I took a look at my patient, whose mouth was opened quite wide.

Suspecting dislocation of the inferior maxilla, I was about taking steps for its reduction, when she grasped her chin with her thumb and forefinger and threw the condyles in place.

I made inquiries as to this condition of affairs, and thought to get a little history; but, no, the whole matter, when summed up, was, that "*it was so ever since she could remember.*" At my request she disarticulated her jaw a number of times.

On examination, with my fingers upon the condyles during their passage from the glenoid cavity over the *eminentia articularis*, there was no great obstacle nor "hitching" against the malar bone by the coronoid processes, as is the case in dislocations of this kind. The appearance in front of the opening of the external ear showed great enlargement of the condyles, perhaps two or three times the ordinary size. A tumor would be suspected; but this moving backward and forward with the jaw, and passing forward and downward during the dislocation, and both sides being alike, prove enlargement of the condyles.

SIoux CITY, IOWA.

Dental Associations.

SECOND ANNUAL MEETING OF THE STATE DENTAL SOCIETY OF PENNSYLVANIA.

Reported by Dr. G. W. NEIDICH, Recording Secretary.

The second annual meeting of the State Dental Society of Pennsylvania was held in the Board of Trade Rooms, in the City of Pittsburg, at 10 o'clock, Tuesday, June 21, 1870.

The President, Prof. T. L. Buckingham, being absent, Dr. George B. McDonneld, First Vice-President, assumed the duties of the chair.

Members present—Drs. A. B. Robbins, Samuel Welchens, George W. Neidich, John McCalla, J. G. Templeton, Wm. Nichols Amer, J. Z. Hoffer, E. M. Pierce, G. B. McDonneld, M. H. Webb and Prof. G. T. Barker.

A majority of the Board of Censors being absent, Dr. John McCalla was elected to act as Censor, *pro tem*.

The Board of Censors report having examined the Constitution and By-Laws of the Pittsburg Dental Association, and find them in harmony with the Constitution of the State Dental Society; they recommend that Articles III and XIV be so amended as to admit none to membership except dentists in regular practice, and of good standing. They also report the credentials of the following delegates from their respective societies as being satisfactory, viz:

From the Lake Erie Dental Association.—Drs. C. D. Elliott, C. B. Ansart, C. H. Bagley, George J. Luce.

From the Pittsburg Dental Association.—Drs. M. E. Gillespie, James King, H. W. Arthur and J. D. White.

From the Harris Dental Association.—Drs. D. R. Hertz, J. S. Smith and A. F. Herr.

From the Pennsylvania College of Dental Surgery.—Prof. George T. Barker.

Report accepted, and the above delegates, on signing the Constitution, were declared members.

An address of welcome was delivered to the members of the State Dental Society, by Dr. James S. King, on behalf of the Dentists of Pittsburg and vicinity, which was replied to by Dr. Samuel Welchens, for the State Dental Society.

The Board of Censors further report the credentials of Dr. James Orr, from the Pittsburg Dental Association, as entitling him to membership.

The Executive Committee recommend that the sessions of the Society, during this meeting, shall be from 9 to 12 A. M., and from 2½ to 5½ P. M.; that a public address be delivered on Wednesday evening, at 8 o'clock; that Thursday morning be devoted to clinics, operative and mechanical, together with the presentation of cases, instruments and appliances. Report accepted, and recommendation adopted.

The Publication Committee report having examined and published all essays and papers that were placed in their hands.

The delegate to the New York State Dental Society, Dr. A. B. Robbins, reports having been unable to attend that body. Dr. J. G. Templeton, delegate to the Ohio State Dental Society, also reports non-attendance, on account of absence from home. Dr. George B. McDonnell, delegate to the American Dental Association, reports having attended the meetings of that body, and that the interchange of opinions and sentiments have been very agreeable and instructive.

Adjourned until 2½ o'clock.

AFTERNOON SESSION.

The special committee appointed for the revision and presentation of

the bill to the Legislature, report that they had prepared a bill, such as they judged would be acceptable to the profession, and would accomplish the desired end, or at least be a basis upon which further legislation might be secured. They advanced a step over last year, by having it reported from the Executive Committee to the House, but failed in securing its passage; yet at the same time feel encouraged to continue the effort. The committee recommend that an appropriation be made to continue the application. Report accepted, and committee discharged.

On motion, a new committee, to consist of Drs. Robbins, McCalla, Moffitt and Martin, was appointed, to continue the application of this Society for legislative enactments to improve the profession, with power to draw upon the Treasurer for funds necessary to prosecute the work.

The amendments to the Constitution, proposed at the last annual meeting by Dr. Robbins, were next considered, and, on motion, the first amendment was adopted, viz: "That Article XI be amended by substituting 'the members present,' for 'a full quorum.'"

The second amendment, viz: "That the Constitution of the State Dental Society of Pennsylvania be amended by adding the following article: 'Any member of the State Dental Society, in good standing, may, upon passing a satisfactory examination by the Censors, with the approval of the Society, receive a certificate, constituting him a Fellow of the State Dental Society of Pennsylvania, under seal, signed by the Censors, President and Secretary,'" was ordered to lay over until our next meeting for reconsideration.

The committee appointed to procure a seal for the Society being absent, and unable to report, was discharged, and a committee of three, viz: Drs. Welchens, Robbins and McCalla, appointed to procure such seal before the next annual meeting.

By a vote of the Society, the order of business was suspended, and the election of officers postponed until Thursday afternoon.

The place for holding our next annual meeting being in order, Lancaster and Gettysburg were proposed, and, by a vote of the Society, Gettysburg was chosen.

Letters were read by the Secretary from Drs. W. A. Breen and M. Lukens Long, asking to withdraw from the Society. On motion, their requests were granted.

The Board of Censors report favorably on the credentials of Drs. S. Davis and W. E. Magill, of the Lake Erie Dental Association, and, on motion, they were declared members.

The Treasurer was ordered to pay all bills incurred for the use of this Society, properly signed and countersigned.

Prof. George T. Barker described a method of using rubber, by which

the hard rubber patent might be avoided. His plan was, by using soft rubber, or the ordinary rubber, partly vulcanized, for the plate; the teeth being secured by arches of tin fastened to the pins, and extending around the inside of the teeth. He stated certain improvements, which would have to be made before it would be practicable.

The experience of the members was called for in reference to whalebone rubber, and those who have tried it consider it an improvement on the ordinary rubber.

WEDNESDAY MORNING.

The minutes of yesterday read, corrected and approved.

The Recording Secretary was directed to read the Constitution and By-Laws for the benefit of new members.

On motion, the clergy, physicians and dentists of the city were invited to attend all the sessions of this body.

An essay was read before the Society by Dr. John McCalla, of Lancaster, on "Extracting Teeth,"* describing the instruments and modes of performing the operation, of both ancient and modern times; the improvements made on instruments from time to time, and giving a description of the most approved instruments of the present day.

The subject of the essay was opened for discussion by Dr. Magill, who considers simplicity in instruments desirable; uses as few instruments as possible; advocates a low chair, and desired to do his work quickly; position was everything; wants to be master of the situation; does not recommend lancing of gums, except for going through the process, and in that case makes a vertical incision only.

Prof. Barker said the operator should study the law of forces; did not think strength so necessary as a correct application of the force; thought the proper use of the upward or downward force one of the elements of success; the alveolus should be crowded out of the way; advocated but one instrument when practicable, particularly when administering anæsthetics.

Dr. Gillespie said, while general rules might be given for the performance of the operation, yet there are cases which must be decided upon at the time by our good judgment; thought lancing not generally necessary, except at the posterior side of the wisdom teeth; advocated Physick's forceps for the dens sapientia.

Dr. Robbins suggested that, in connection with this subject, we should discuss the subject of when to extract.

Dr. Magill related a case of what he supposed to be neuralgia, but found, after extraction, to be ossification of the pulp; he inquired of the

* Published on page 1.

Association if there were any reliable symptoms accompanying exostosis and ossification of the pulp.

Prof. Barker said pain from exostosis is never permanently relieved by topical applications, sometimes temporarily by cold water; wished the Society to pass a resolution that no tooth should ever be extracted which might be made serviceable to the patient; that the wishes or present feelings of the patient should not be considered; wished this Society would stigmatize the wholesale destruction of the natural teeth. Prof. Barker offered the following resolution:

Resolved, That it is the judgment of this Society, that no teeth should ever be extracted which, by proper treatment, may be made serviceable to the patient.

On motion, adopted by the Society.

Dr. J. G. Templeton read an essay on "Mechanical Dentistry,"* describing the different methods, and advantages of each method of making artificial teeth.

Adjourned until 2½ o'clock.

AFTERNOON SESSION.

The subject of Dr. Templeton's essay being open for discussion, Prof. Barker described the different varieties of palatine defects, and his method of taking impressions for the purpose of constructing appliances to remedy these defects; uses a piece of sponge, size of the aperture, fastens a wire for the purpose of holding it, saturates the sponge with batter of plaster, and secures the impression in one piece.

Dr. Luce described a method of using aluminum as a base, securing the teeth to the plate by means of rubber; punches holes underneath the blocks, and countersinks well on the under side; sometimes covers the whole surface of the plate with rubber.

Prof. Barker exhibited an aluminium plate soldered, and described the process of making the same, as follows: strike up the plate, arrange the teeth, and wax up the same as for rubber; insert in flask, separate, remove the plate, and scrape carefully where the solder is to be applied; melt solder on the plate without flux, by holding over an alcohol lamp with pliers, same as tinning iron; plate replaced in lower flask; upper flask containing teeth carefully heated; solder melted and poured around pins, gates having been cut for excess to escape; flask closed and allowed to cool.

Dr. Barker said the process described by Dr. Luce was similar to that of Dr. T. Yardley Brown, of Reading, with the exception that Dr. Brown used a fusible metal instead of rubber. Either process he thought ob-

* Published on page 15.

jectionable, on account of the secretions getting between the plate and rubber, or plate and fusible metal.

The Secretary read a letter from Dr. B. T. Whitney, President of the New York State Dental Society, asking for the assistance of this body, in their efforts to elevate the profession by establishing a degree. Ordered to be placed on file, and to be answered by the Corresponding Secretary. A letter was also read from Prof. J. H. McQuillen, regretting his inability to be present.

Dr. Geo. B. McDonneld read an essay on "The Treatment of Exposed Pulps." Dr. Robbins opened the discussion by asking for some definite information as to the best material to be used for capping nerves, or whether, and under what circumstances the operation was advisable; whether any benefit could be derived from constitutional remedies. Dr. Gillespie was eclectic in his practice; sometimes succeeds with one material, sometimes with another, but was willing to be content if he succeeds in the large portion of cases; uses carbolic acid as a preliminary application; prefers oxychloride of zinc for filling; the pain from its application usually subsides in a short time. Dr. Robbins thinks the pain may be obviated by using a weaker solution of the chloride. Dr. Barker believes in using carbolic acid and a strong solution of the chloride. Dr. James S. King has had considerable success in the treatment of exposed pulps, thinks a great deal depends upon the proper manipulation of the paste; does not use carbolic acid; prefers pure creosote; thinks 95 per cent. of exposed pulps can be saved; does not always fill immediately; sometimes treats for some time with creosote; thinks in the worst cases there is a chance of success, and considers it our duty to use the chance; thinks gutta percha not so good as oxychloride. Dr. Barker thinks it impossible to obtain *pure* creosote. Dr. Neidich thinks success almost certain in good subjects and recent exposure; thinks pressure, or the forcing of foreign substances through the aperture is the cause of most failures; considers gutta percha quite as good as oxychloride of zinc, perhaps a little more difficult to apply without pressure, but not so much pain in the application; does not think there is any difference in the action of creosote and carbolic acid; believes the pulps have sufficient recuperative powers to close the opening if protected from thermal changes and external irritants; has seen such cases closed by secondary dentine, or calcification of the pulp, without the aid of art; does not believe a diseased pulp can ever be restored to health; in such cases always extirpates.

A public address was delivered on Wednesday by Dr. Sam'l Welchens, on "Association as an Element of Improvement."*

* Published on page 24.

THURSDAY MORNING.

Minutes of yesterday read, corrected and adopted.

This morning being set apart for clinical operations, and the presentation of cases, instruments, mechanical appliances, &c., Professor Barker described a case upon which he proposed operating, viz: The filling of a compound cavity in a right superior second molar, anterior and grinding surfaces, extending somewhat beneath the gum; pulp covered by secondary dentine. Dr. Barker operates under difficulties, not being accustomed to the chair, instruments, foil, &c. The foil was manufactured by Mr. Dunlevy, gold beater, and kindly furnished to the Society free of charge. Dr. Barker commenced his operation on three retaining points at the cervical wall, this part being protected by wedges; used No. 8 gold foil for the anchorage and floor of cavity, then successively Nos. 20, 60 and 120; used a tin mallet, weighing $1\frac{1}{2}$ ounces.

A case of necrosis of the inferior maxillary bone was presented to the Society. A gentleman, æt. 55, strumous diathesis, greatly emaciated from the excessive discharge of pus, great anxiety of countenance. Patient had been operated upon several times, but the operation failed for want of the complete removal of the dead bone. The treatment recommended by Prof. Barker, whose judgment was asked by the Society, was good, nourishing food, cheerful company to relieve the mental anxiety, tonics, plenty of fresh air, and the complete removal of sequestrum, preserving, if possible, a border of the maxilla and the periosteum.

A case of a young lady afflicted with an osseous or cartilaginous tumor of the inferior maxilla was also presented. Patient of good health, æt. 17, sanguino-bilious temperament; tumor caused by the unskillful extraction of a molar tooth, evidently accompanied by an abscess from a remaining root; gum of a purple aspect, fistulous opening. The treatment proposed was the removal of the root, and the application of a strong ethereal solution of iodine to the maxilla, both externally and internally.

Dr. S. S. White, of Phila., through his agent, Mr. S. T. Jones, exhibited a very fine assortment of instruments, teeth, &c., presenting the latest ideas of some of the leading operators of the profession. At the request of the Society, Dr. A. B. Robbins explained the advantages of the designs of different originators.

The Treasurer reports a balance of \$37.26 remaining in his hands, after paying all orders drawn upon him. Examined by the Executive Committee, and found correct. Accepted by the society.

AFTERNOON SESSION.

The special order of business being the election of officers to serve for the ensuing year, the society elected by ballot the following officers, viz:

President.—Dr. JOHN McCALLA, Lancaster, Pa.

1st Vice President.—Dr. J. G. Templeton, Newcastle, Pa.

2d Vice President.—Dr. M. E. Gillespie, Pittsburg, Pa.

Recording Secretary.—Dr. C. H. Bagley, Meadville, Pa.

Assistant Recording Secretary.—Dr. C. B. Ansart, Oil City, Pa.

Corresponding Secretary.—Dr. Samuel Welchens, Lancaster, Pa.

Treasurer.—Prof. G. T. Barker, Phila., Pa.

Board of Censors.—Dr. A. B. Robbins, Meadville, Pa.; Dr. W. E. Magill, Erie, Pa.; Dr. J. D. White, Pittsburg, Pa.; Dr. Geo. W. Neidich, Carlisle, Pa.; Dr. Geo. J. Luce, Titusville, Pa.

The President appointed, with the approval of the society, the following committees, viz:

Executive Committee.—Drs. A. B. Robbins, Geo. W. Neidich, William Nichols Amer, J. Z. Hoffer, G. T. Barker.

Publication Committee.—Profs. G. T. Barker, J. H. McQuillen, T. L. Buckingham, Drs. J. S. King, C. H. Bagley, Samuel Welchens, W. N. Amer.

The President and Secretary were authorized to issue credentials to any six members who wish to attend as delegates to the American Dental Association. Dr. W. E. Magill was appointed a delegate to the New York State Dental Society, and Dr. J. S. Smith a delegate to the Ohio State Dental Society.

The following members were appointed as essayists for the next meeting, viz: Prof. G. T. Barker, Drs. Samuel Welchens, Geo. W. Neidich, and George J. Luce, and were requested to announce the subjects of their essays, as soon as possible, to the Corresponding Secretary.

The following resolution was offered to the Society:

“WHEREAS, the editor of the ‘DENTAL TIMES’ generously offers to publish the papers and proceedings of this Society, and furnish a copy to each member free, therefore,

“Resolved, That a copy of our papers and proceedings be furnished the ‘DENTAL TIMES’ by the Publication Committee.”

Dr. McCalla moved to amend the resolution, by substituting “dental journals,” for “DENTAL TIMES.”

Amendment lost, and resolution adopted.

Adjourned, to meet at Gettysburg on the second Tuesday in June, 1871. Session to continue three days.

THE ASSOCIATION OF THE ALUMNI OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

A preliminary meeting of a number of the graduates of this College was held on Thursday evening, March 24th, 1870, for the purpose of forming an Association of the Alumni of the College. At that meeting a committee was appointed to draft a Constitution and By-Laws for the proposed Society, to be reported at a subsequent meeting of the graduates.

Circulars announcing that an adjourned meeting of the graduates would be held on Friday evening, April 1st, for the purpose of organizing such an association, were sent to the Alumni residing in the city, and also to all within a reasonable distance. At this adjourned meeting there was a good attendance. The Constitution and the Order of Business reported by the committee were adopted, after slight amendment, as follows:

CONSTITUTION.

ARTICLE I.—NAME.

The name of this organization shall be, *The Association of the Alumni of the Pennsylvania College of Dental Surgery.*

ARTICLE II.—OBJECTS.

The objects of this Association shall be, to promote social intercourse among the graduates, and by united effort to aid in every way the advancement of dental education.

ARTICLE III.—MEMBERSHIP.

Section 1. As the *Pennsylvania College of Dental Surgery* is a continuation, except in name, of the (former) institution known as the *Philadelphia College of Dental Surgery*, the members of this Association shall consist of those who have received the regular or honorary degrees in either school, and also, those who have been or may be professors in this College.

Sec. 2. Each new member, before taking an active part in the meetings, must sign the Constitution and pay the annual fee of one dollar.

Sec. 3. Any member guilty of unprofessional conduct shall, upon charges being preferred in writing by *two members*, be subjected to trial by a special committee of five members appointed for the purpose; and should the charges be sustained, he shall be reprimanded, suspended or expelled, as the Association shall determine.

ARTICLE IV.—OFFICERS.

Sec. 1. The officers of this Association shall be a President, Vice President, Recording Secretary, Corresponding Secretary, Treasurer, and

an Executive Committee consisting of five members, three of whom shall be residents of Philadelphia, or its immediate neighborhood, the other officers of the Association being members, *ex-officio*, of the same. They shall be elected at the annual meeting, by ballot, and shall retain their positions until their successors are chosen.

Sec. 2. The *President* shall preside at all meetings of the Association, according to parliamentary usage.

Sec. 3. The *Vice President* shall assist the President, and in his absence perform all the duties devolving on that office.

Sec. 4. The *Recording Secretary* shall keep accurate minutes of the proceedings of the Association, preserve all books and papers, and attend to all duties that pertain to his office. He shall give due and timely notice of all meetings to the Alumni, and for this purpose shall keep a separate book, with the names and residences of graduates, whether members in good standing or otherwise. The incumbent of this office shall be a resident of Philadelphia.

Sec. 5. The *Corresponding Secretary* shall attend to the correspondence of the Association with other organizations.

Sec. 6. The *Treasurer* shall receive all moneys paid into the Association, and keep an accurate account with each member. He shall notify all members in arrears for dues, and shall report the same at each annual meeting. He shall pay no money except on drafts properly countersigned by the President and Secretary, and only upon a vote of the Association. He shall make a report in full to the Association at the close of his term of office.

Sec. 7. The *Executive Committee* shall be the business committee of the Association. To it all business occurring in the intervals of meetings shall be referred. It shall make all necessary arrangements for the annual or special meetings, and for the *Reunion* provided for in *Article V, Sec. 3*.

ARTICLE V.—MEETINGS.

Sec. 1. There shall be but one stated meeting held during the year. This shall convene in Philadelphia, in the College Building, at 10 o'clock, A. M., on the day upon which the Commencement of the Pennsylvania College of Dental Surgery occurs.

Sec. 2. The morning session shall be devoted to an address by the President, scientific essays, &c., followed by any other business that may require attention.

Sec. 3. In the evening, after the Commencement Exercises, there shall be a *reunion* of those members of the Alumni present, to be under the charge of the Executive Committee, as provided for in *Article IV, Sec. 7*.

ARTICLE VI.—QUORUM.

Ten members shall constitute a quorum for the transaction of the business of the Association.

ARTICLE VII.—BY-LAWS.

This Association shall have power to make rules or by-laws for its regulation, and to do every other act and thing needful for the good government and support of the affairs and objects of the Association.

ARTICLE VIII.—AMENDMENTS.

This Constitution may be amended by a *two-thirds* vote, at the next meeting subsequent to that at which the written proposition for the alteration was made.

ORDER OF BUSINESS.

1. Organization of the meeting at 10 o'clock, A. M.
2. Calling roll of qualified members.
3. Reading of the minutes.
4. Address by the President.
5. Reports of Standing Committees.
6. Reports of Special Committees.
7. Election of Officers.
8. Unfinished business.
9. New business.
10. Installation of Officers.
11. Adjournment.

The meeting then proceeded to the election of officers, when the following gentlemen were chosen to serve until the annual meeting:

President.—Prof. JAMES TRUMAN.

Vice President.—C. N. Pierce.

Recording Secretary.—E. R. Pettit.

Corresponding Secretary —Wm. H. Trueman.

Treasurer.—E. H. Neall.

Executive Committee.—T. L. Buckingham, E. T. Darby, Robert Huey, Philadelphia; J. G. Templeton, New Castle, Pa.; Wm. Smedley, West Chester, Pa.

Letters have been received from some who were unable to be present, expressing their approval of the Association, and their desire to co-operate with those taking a more active part in its organization. The officers of the Association are determined that nothing shall be left undone to insure a pleasant and profitable reunion on the evening of the next Annual Commencement of the College.

It will be observed that Article III of the Constitution provides that the membership of this Association shall also include the graduates of the (former) Philadelphia College of Dental Surgery. The reason for this will be understood by the more recent graduates of the present institution, when they learn that the Board of Trustees of the Pennsylvania College of Dental Surgery appointed the same Professors to the various chairs that had taught in the old College; and as this Faculty had procured the rooms, and furnished all the appliances for teaching in the first College, this second one was but a continuation of the first, working under a different name.

Particular attention is called to that portion of Article IV, Sec. 4, which requires the Secretary to keep a record of the names and residences of the Alumni of both institutions, whether members of the Association or not. As changes of residence are frequently made, it will be impossible for him to do this without the co-operation of the graduates. The undersigned, therefore, particularly requests that *all* the graduates will send him their names and address without delay, whether they desire to become members of the Association or not. Those who desire to join the Association may remit the annual fee (one dollar) at the same time.

E. R. PETTIT,

No. 1104 Arch St., Philadelphia, Pa.

The Tenth Annual Session of the American Dental Association will be held in Nashville, Tenn., commencing at 10 o'clock on Tuesday, the 2d day of August next.

The Executive Committee and Treasurer will be in readiness at 8 o'clock to examine credentials, receive dues, &c.

I would suggest the following amended form for certificates:

"This certifies that ——— was duly appointed a delegate to the American Dental Association, on the — day of —, 1870, by the Dental Society of —, and that said — is a dentist of good character and standing, and at this time in regular practice.

"The — Dental Society has adopted [or substantially adopted] the code of ethics of the American Dental Association.

——, *Secretary.*

——, *President."*

"Each local society may send one for every five of its active members, and each Dental College one from its faculty, as delegates to this Association for one year, upon complying with the requirements of its constitution; but no society shall be entitled to representation that does not adopt or substantially recognize its code of ethics."—*Constitution A.D.A.*

M. S. DEAN, *Recording Secretary.*

Editorial.

THE STATE DENTAL SOCIETY OF PENNSYLVANIA.

This Society held its annual meeting in the city of Pittsburg, on the third Tuesday of June, (21st inst.,) and continued in session three days. It was our privilege to be present, and we have never, in any dental gathering, met a body of men so earnest and industrious. The attendance of delegates from local societies was quite large, there being also a number of practitioners present, who, though not delegates or permanent members, hence unable to take part in the proceedings, yet evinced great interest in the meetings, many being in constant attendance.

It was plainly to be seen that the members came for work, and no time was lost in useless debate over parliamentary rules, or "wire pulling" of any kind, and the discussions, and papers which were presented, were alike creditable to the authors and the society.

The publication of the papers, and a lengthy report of the proceedings, compel us again to leave over for future publication several articles which we had hoped to be able to present at this time. G. T. B.

THE AMERICAN DENTAL ASSOCIATION.

We have received the following from Dr. E. A. Bogue, which we publish with pleasure, and, at the same time, express the hope that the next meeting of the Association at Nashville will be a grand reunion of members of the profession from all sections of the country, alike actuated by desires for professional advancement and scientific development. We believe the meeting, from all we hear, will be largely attended. G. T. B.

NEW YORK, June, 1870.

The Erie Railroad Company has agreed to sell tickets to those wishing to attend the American Dental Association, at Nashville, for half fare, that is, \$34 for a ticket from New York to Nashville and return, good for thirty days. All living in New England or near New York, at any point, can obtain tickets at this rate by sending money orders for this amount named to J. F. Phelps, ticket agent of the Erie Railroad, No. 957 Broadway, New York City.

E. A. BOGUE, *Chairman of Committee.*

THE PHYSIOLOGICAL ACTION OF PROTOXIDE OF NITROGEN.

BY JOHN J. COLTON, M. D., PHILA., PA.

It has been a disputed point among scientific men, ever since the protoxide of nitrogen came into general use as an anæsthetic, whether its action depends upon oxidation, or whether the carbonic acid generated either by the ordinary disintegration of tissue or by super-oxidation, produces the anæsthesia. Eminent gentlemen in this country and Europe have maintained (and with some plausibility) that carbonic acid, by its action upon the nerve centres, produces the anæsthesia, arriving at this conclusion from the fact that evidences of asphyxia are, in some cases, so manifest, while others have held to the theory of oxidation.

Having administered this gas to many thousands of persons, having inhaled it in my own person hundreds of times during as many successive days, and having carefully watched its effects upon the system under the greatest variety of circumstances and conditions, I have maintained that its action must depend upon oxidation, and that the indications of asphyxia, (slight in ordinary cases,) are merely an incidental effect rather than the main cause of the anæsthesia.

The following experiments, it seems to me, clearly establish this theory:

Exp. 1. Take two jars, of equal size, filled with lime water; pass a definite amount of air as it comes from the lungs through one solution, and it is rendered turbid; pass an equal amount of nitrous oxide as it escapes from the lungs through the other solution, and it is also rendered turbid, but to a greater degree than the first, indicating the presence of carbonic acid in greater quantity.

Exp. 2. Breathe through a tube into a solution of litmus blue, and it is changed to red. It will take, we will say fifteen seconds, to effect the change, (the time depending upon the strength and quantity of the solution.) Now breathe nitrous oxide gas through another solution of the same strength and quantity, and we shall notice the change of color in from ten to twelve seconds, indicating the elimination of carbonic acid to a greater extent than the normal amount, while breathing the gas, as in the first experiment.

Exp. 3. Take a full inspiration of air, retain it in the lungs for one minute, and there are no indications of anæsthesia. Now try the same experiment with the gas, and the anæsthetic effect is manifest almost to insensibility, while there are no indications of asphyxia.

We have thus demonstrated by the first two experiments, that while breathing protoxide of nitrogen, an increased amount of carbonic acid is exhaled, and as this excess *must* be produced by oxidation, we *reasonably* infer that the action of the protoxide is oxidation; and the third experiment furnishes corroborative testimony, though of a negative character, for if the retention of carbonic acid causes the anæsthesia, why are there not some indications when air is retained in the lungs?

If we inhale pure nitrogen, we still exhale carbonic acid for a time, owing to the union of the oxygen previously introduced into the system with the carbon and hydrogen of the tissues, but the amount is sensibly diminished. Now, this diminished amount of carbonic acid might have been anticipated, since we have not furnished sufficient oxygen to produce the normal amount. But on the other hand, when we find an increased amount of carbonic acid, we infer a corresponding increase of oxidation.

But it is objected that nitrous oxide is not a mixture of gases like the air, but a chemical compound, and therefore, it does not act by oxidation. Let us see.

Exp. 4. Plunge a lighted taper into the gas, and it burns with greatly increased brilliancy; the heated elements of the taper presenting a stronger affinity for the oxygen than the nitrogen does, take it and form the new combinations, carbonic acid and water. This fact shows the affinity of the elements composing nitrous oxide to be feeble.

Reasoning, now, from analogy, we might be led to infer that similar results would follow the introduction of the gas into the system, and such we find to be the case. The oxygen of the gas, by its stronger affinity, seizes upon the carbon and hydrogen of the tissues, with the same results of combination as in the case of the taper; in other words, we have super-oxidation.

But it is objected that *pure oxygen* exerts a less powerful action upon the system than the gas, which is two-thirds nitrogen. The answer is simply that the blood absorbs but a small percentage of oxygen, so that when it is introduced into the lungs it finds its way into the system slowly, while nitrous oxide is rapidly absorbed and conveyed to the tissues, to be given up for combination.

Exp. 5. If one takes a full inhalation of the gas, he instantly feels a thrill throughout the entire system. This is the incipient stage of anæsthesia, and the rapidity of its action is another proof of the theory of oxidation; for if these sensations were caused by the accumulation of carbonic acid, we should hardly anticipate such a result in the course of a few seconds.

It is still further objected, that the asphyxiated appearance of persons under its influence, indicating a superabundance of carbonic acid in the system, suggests, at least, that it is the cause of the anæsthesia. The third, fourth and fifth experiments furnish proof of the absurdity of this conclusion.

Moreover, the principal evidence of asphyxia, ordinarily manifested, is the cyanosed tint of the lips, which is, in part, produced by pressure in holding them tightly upon the inhaling tube, while in certain cases, in which these evidences are more striking, there is a cessation of breathing, caused by the tongue falling back upon the epiglottis; by removing this obstruction, and allowing the patient a breath of air, the symptoms of asphyxia disappear. If the inhalations be prolonged to extreme limits, we shall also notice the asphyxiated appearance, owing to the accumulation of carbonic acid.

The above indications furnish the main argument in favor of the carbonic acid theory. That there accumulates in the system a larger than the normal amount of carbonic acid is evident, and this is entirely consistent with the theory of oxidation; but this accumulation is not in sufficient amount in ordinary cases to attract attention, certainly not enough to produce profound insensibility. Moreover, the effects of nitrous oxide upon the system are not such as we should anticipate were they caused by the action of carbonic acid, for it is depressing in its influence. Even if a slight impediment is offered to its elimination from the lungs, "a feeling of discomfort and depression, increasing with the duration of the interruption, is speedily felt."

Now, while inhaling the nitrous oxide, although there is an increase of carbonic acid in the system, yet, if it be in sufficient amount to produce anæsthesia, how shall we explain the immediate reaction, and the agreeable sensations while inhaling, as well as for some time subsequent.

In the ordinary use of stimulants, there follows "a period of depression corresponding to the exaltation of the functions excited," yet persons who have submitted to the influence of nitrous oxide, give no indications of this character. On the contrary, there ordinarily follows a period of exhilaration, just what might be anticipated from an excess of oxygen. The system resumes its normal condition as soon as the oxygen has been disposed of by union, and the carbonic acid and other products of oxidation eliminated, which process is very rapid—while chloroform, ether, alcohol, and other narcotics and stimulants linger in the system much longer, and, by their prolonged action upon the nerve-centres, produce their depressing effects and obstruct oxidation.

But the wonderful power of the nitrous oxide yet remains to be explained. It is a well known principle of chemistry, that elements in the nascent state, just liberated from union, exhibit remarkable characteristics and properties. Nitrogen and hydrogen, for example, placed in a jar together, manifest no affinity for each other, and cannot be induced to unite, even by the application of the most intense heat; but let them come together just at the moment of liberation from other compounds, and they combine with the utmost avidity. This is the precise condition in which the oxygen of the protoxide is found, as it enters into combination with the tissues of the body—just liberated from its union with nitrogen, it is in its nascent state—the active condition, and thus it exhibits its extraordinary powers of oxidation.

I have in this brief and cursory manner endeavored to prove, (1) that persons breathing protoxide of nitrogen exhale a larger amount of carbonic than while breathing common air; and (2) that its action is essentially oxidation, and that the excess of carbonic acid in the system is merely incidental, and in no wise sufficient to produce anæsthesia; and (3) that its inoffensive effects are due to its action as an oxydizer; and (4) that no subsequent depression follows, but rather a rapid reaction; because, acting by oxidation, the products of its combinations are speedily eliminated from the system; and (5) that its remarkably powerful action is due to its entering into new combinations just at the moment of its liberation, when in its nascent state.

I shall reserve for a future article what I had intended to say of its uses and abuses, and close by expressing my profound conviction that the pure protoxide of nitrogen, administered within proper limits, is harmless in its action, while if made from contaminated materials, if generated at too high a temperature, if used immediately after it is made, if the impurities ordinarily found in it be not removed, if inhaled in sufficient quantity to produce profound anæsthesia, after being prepared for a few days, or if the administration of the *pure gas* be persisted in beyond *certain limits*, it is capable of an immense amount of mischief. At the same time, I would express the earnest desire that a free and full discussion of the subject may afford a better knowledge of its physiological action, and increase its value as an agent for the relief of human suffering.—*Med. and Sur. Reporter.*

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The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical peculiarities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND MICROSCOPIC ANATOMY.

The lectures from this chair will include a consideration of the entire subject of human physiology and physiological chemistry, with such portions of comparative physiology as are essential to a comprehensive understanding of the subject; also, the doctrines of life and organization. They will be amply illustrated by a appropriate chemical experiments and vivisections.

The minute structure of the organs involved in the organic and animal functions will be carefully described and illustrated by diagrams and the class microscope.

ANATOMY AND SURGERY.

The instruction in this department will embrace a systematic course of Lectures on Descriptive and Surgical Anatomy, fully illustrated by dissections on the *cadaver*, preparations, models, drawings, &c.

The minute anatomy of the various organs and tissues of the body will be shown by the class microscope, and particular attention will be given to the demonstration of the anatomy of the head and face.

Clinical instruction in the diagnosis and treatment of the surgical diseases of the mouth will be given once a week by the incumbent of the chair. Students will thus have the opportunity of studying oral diseases, and witnessing the operations adopted in their treatment.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the demonstrators.

IN THE OPERATIVE DEPARTMENT.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

IN THE MECHANICAL DEPARTMENT.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

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The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupilage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

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IMPAIRMENT OF VISION THE RESULT OF DENTAL IRRITATION.

BY P. D. KEYSER, M. D.,

Surgeon to and Clinical Lecturer on Ophthalmology in the Philadelphia Eye and Ear Infirmary.

[Read before and published by request of the Medico-Chirurgical Society of Philadelphia.]

Contraction of the field and impairment of vision (amblyopia) is sometimes due to pathological irritation of the dental branches of the fifth nerve, (trigeminus,) by aching of an exposed pulp in a carious tooth, or long continued dental and facial neuralgia. Some of the earlier writers claimed that amaurosis could be caused by an abscess in the antrum as well as from carious teeth. Richter, in 1795, mentions a case of a lady who was blind for some years, recovering her sight almost immediately after having a tooth drawn that had troubled her for a length of time. Beer, in 1817, speaks of a consensual nervous affection of the eyes, that was caused by a carious upper molar, which was cured on its extraction. Deval says, that a case of a chronic relapsing inflammation of the eye was cured as by magic on the removal of a tooth.

It was, however, contradicted, and not allowed by many writers, and was not received by the profession as one of the positive causes of amblyopia and amaurosis, until Hutchinson, (London,) called the attention of the oculists to it in a very able paper, entitled "A Group of Cases Illustrating the Occasional Connexion between Neuralgia of the Dental Nerves and Amaurosis," published in the *Ophthalmic Hospital Reports*, Vol. IV, 1865. He begins by the conjecture, that many cases of loss or contraction of vision in infancy, is caused, during the period of dentition, by the reflex irritation of the dental nerves, just as we have spasms from the same cause. He gives the notes of five interesting cases of amblyopia and amaurosis, arising from neuralgia or carious teeth. In 1866, Wecker, (of Paris,) confirmed this view in a letter to Delgado, (of Spain,) in which

he mentions several cases, all of which were cured on the removal of the teeth. Alexander, (of Aix la Chapelle,) gives an account of a case of amaurosis, in consequence of dental neuralgia, in the *Klin. Monatsblt. für Augenheilkunde*, February, 1868, where the patient could only make out types Jaeger XV with the right eye, and Jaeger VI the left. The examination of the fundus of the eye with the ophthalmoscope gave a negative result, and after three days treatment without result, he discovered that the first right upper molar was carious and aching, and concluded that the loss of vision was from it, and ordered it removed; two days after which the sight was again normal.

Schmidt, (of Berlin,) has an exhaustive article "Upon the Reduction of the Power of Accommodation by Tooth-ache," in the *Archiv. für Ophthalmologie*, Vol. XIV, Part I. He examined the sight of ninety-two cases, who were attending the dental clinic of Dr. Albrecht, for carious teeth, &c., and found that only nineteen had perfectly normal sight, while seventy-three of the cases suffered from some loss of vision; in some of whom the reduction of accommodation was very great.

Other affections of the eyes, besides amblyopia and amaurosis, arise from carious teeth. F. M. Mackenzie gives a case of circumscribed scleritis, accompanied by aching in the second molar tooth of the same side, which was only cured on the extraction of the tooth, after all other treatment had been tried without effect.—*Oph. Hosp. Reports*, Nov., 1869.

It has now become an accepted fact, that affections of the eye, particularly that of amblyopia, can be the result of reflex irritation from dental nerves, as from neuralgia, &c. And in all the recent works of ophthalmology, mention is made thereof, although it is touched so lightly as to look as if yet somewhat doubtful. Stellwag, page 673, says "that amaurosis sometimes results from traumatic periostitis of the orbit, from ozena, from abscesses of the antrum, with subsequent caries of the orbit, as is often caused by diseased teeth." Wells (*Treatise on the Eye*, page 413,) writes, "amblyopia is sometimes due to reflex irritation originating in one of the branches of the fifth nerve, or in other parts of the nervous system. Thus, severe and prolonged dental neuralgia may produce impairment of vision, which mostly disappears with the removal of the carious teeth." Wecker (*Traité Pratique des Maladies des Yeux* 1868, Tome II, page 437,) speaks more fully on this point, mentioning the researches of Hutchinson, Schmidt and himself, establishing, without doubt, that amblyopia and amaurosis can take place from the irritation of the fifth pair by tooth-ache and dental neuralgia.

In illustration of this idea, I present the following cases that have come under my treatment the past few years:—

May, 1866.—Frederick S——, æt. 18, came to me with the report that

his sight had failed in the past two days so that he could not see to read. There was no inflammation of the conjunctiva or ball. Ophthalmoscopic examination gave a negative result, and no special cause could be found for the defect. Upon questioning him as to general health, he said nothing ailed him but severe tooth ache at times. On examination, I found second molar on the right side, and first and second on the left carious, exposing the pulps. At my recommendation they were extracted, and the sight returned to the normal standard the next day.

May 4, 1866.—Frederick W. K——, æt. 37, complained that he had been suffering with dental neuralgia for a week past, and that his sight had become quite dim; could only make out large letters; could not distinguish any person at twenty feet, when, before the attack of neuralgia, his sight was perfect. Nothing abnormal was to be seen in the eyes, or by the ophthalmoscope. His teeth were all sound and in good order. After treatment for neuralgia, which was cured in a few days, his sight returned to its normal standard.

February, 1867.—Mary H——, æt. 18, sight had gradually failed the past week so that she was unable to sew or read. The patient was a fine healthy looking girl; said she had never been sick in her life. Catamenia regular; had all the points of perfect health. With the right eye could with difficulty see Snellen's test types XX, at 10". Left eye could make out the same at 6" only. Examination with the ophthalmoscope gave no clue to the cause, as the fundus was normal. After a few days treatment, without any improvement, I examined her teeth, and found the second bicuspid and first molar of the left side much decayed, and, on inquiry, she said that she had been almost crazy with the tooth-ache off and on for the past four weeks. On the extraction of the teeth, she returned to me three days after with the report that she could sew again.

October, 1868.—George W——, æt. 30, came with the complaint, that six months previous his sight became suddenly dim, and had remained so ever since. Jaeger's test types, No. 17, could be read at 7". Ophthalmoscopic examination gave a negative result. Had not used tobacco or liquor to any great extent—rather moderately. Had always been in good health. After a week's treatment in the generally prescribed methods, without any improvement, I examined his teeth and found caries, of some three or four, with exposed pulps, from which he had suffered for a long time with tooth-ache. Not desiring to lose the teeth, I recommended him to have the nerves destroyed and removed, and then plugged with foil, with the hope of receiving the same benefit as in the former cases when the teeth were extracted. The result was satisfactory; the sight returned again to its normal state after his teeth were fixed, and he returned home to the country.

December, 1868.—J. C. H——, æt. 22, suffering from amblyopia. His vision had become impaired in the left eye the past few days so that he was not able to read with it. Sight in the right eye normal. Left eye, half normal. Ophthalmoscope showed nothing positive. He said that he had been suffering from dental neuralgia for a month, with great soreness of the gums on the left side. Upon examining his teeth, one of the bicuspid, which had been plugged sometime ago, was very tender and felt elongated. Surmising inflammation at the root, with exostosis, was the cause of all his trouble—amblyopia as well as neuralgia—I advised him to have it extracted, which was done the same day, and with the happy result of relieving his neuralgia and return of perfect vision almost at once.

December, 1869.—Mrs. M. F——, æt. 61, came to my clinic complaining of loss of vision in both eyes and floating motes in the right eye the past few days. Could not see to sew or read even with her glasses. Supposed it to be dyspepsia from improperly masticated food, as she was obliged to remove her false teeth from great pain and soreness in two teeth, one on either side, to which they had been fastened for years by clasps. She reports that she had been suffering with considerable tooth-ache for some time, more particularly when she put her artificial teeth in. Ophthalmoscopic examination gave a perfect negative result, with the exception of a couple of small floating particles in the vitreous of the right eye. After nearly a month's treatment for dyspepsia, &c., without beneficial result, I examined the teeth, and found that the clasps had worn into the teeth on which they rested, and in one caries had attacked the part and exposed the pulp. On my recommendation she had the teeth removed, and a new upper set made; after which the sight returned with a presbyopia of one-sixteenth, and has had no trouble since.

Other affections of the eyes than amblyopia, can and do take place from reflex irritation of the branches of the fifth nerve, as in the case of Mackenzie, quoted above, of a scleritis, which could only be cured on the removal of a decayed molar tooth. It is a well-known fact that inflammation of the cornea, and sometimes ulcers of the cornea, take place as the result of disturbance of the conduction of the trigeminal nerve. If there is paralysis of the nerve only, the affection of the cornea is only an infiltration which often recedes. But in complete paralysis, ulceration and destruction take place. Therefore, as severe irritation of the dental nerves, by reflex action, can limit or prevent the proper and full conduction in the fifth nerve, causing neuro-paralysis, affections of the cornea may be the result. Whether the immediate cause of the affection of the cornea be from the neuro-paralysis, or as some writers (Snellen and Winther,) claim, from the various external injuries to which it is exposed,

on account of the insensibility of the organ, the primary cause is from another point, and can be from reflex action of the dental nerves as well as other branches of the fifth nerve.

The following case illustrates the above views:—

June, 1868.—Albert H——, æt. 33, came to me for treatment of inflammation of the cornea of the left eye, with the history, that about ten days or two weeks before, the eye became inflamed without any apparent cause. He had tried the ordinary house remedies without benefit, and on consulting a physician, was recommended to put himself under my treatment. Upon examining the eye, there was infiltration of nearly the whole cornea, with a small spot as beginning ulceration in the centre. There was little if any pain; anæsthesia of the cornea was present, as the touch of a feather or roll of paper was not felt. The patient was of a good, healthy organization, and reported that he had never been sick.

The regularly prescribed treatment for inflammation of the cornea, and attempt to remove the neuro-paralysis was continued for two weeks, without the least change in the cornea for better or worse, the inflammatory process being seemingly at a stand still. Hoping that the continued treatment might induce an improvement, it was tried a week longer, but to no effect. On the last day of the third week the patient came into my office with the left side of his face swollen and tied up, suffering severely from tooth-ache. He then said that he had suffered much for months, off and on, from aching teeth. Thinking that I now had a clue to the primary cause of the neuro-paralysis and inflammation of the cornea, I examined his teeth, and found the first molar of that side much decayed; a very large cavity with exposed pulp. In the cavity were some small red granulations, which easily bled on being lightly touched. At my suggestion he went and had the tooth extracted; after which the cornea began to improve rapidly, and, under the ordinary treatment, the infiltration was all absorbed and the cornea became clear again.

I will here mention a case of reflex action bearing upon this subject, from irritation of the end branches of the trigeminus, of considerable interest, which I saw, while attending Prof. von Graefe's clinic, in Berlin, in the winter of 1863–4.

A fine healthy looking girl of 19 or 20 years, came into the clinic with continual clonic spasms of the orbicularis and facial muscles of one side of the face. In searching for the cause, it was found that, by pressure upon the supra-orbital nerve, the spasm would stop. The nerve was cut through subcutaneously; but, after a day or so, the spasms returned—pressure on the same nerve having no effect. It was then found, that in passing the finger in the mouth, and pressing on the inferior dental nerves of the side

of the face affected, complete control was obtained over the spasms. Neurotomy was here performed, and the patient cured.

In examining the cases described, it will be seen that they were all young subjects, with the exception of one. Agreeing with the researches of Schmidt, as above mentioned, who examined the eyes of ninety-two persons suffering from dental neuralgia and tooth-ache, that any affections of the eye, resulting from dental irritation, occur mostly in young subjects.

Before closing this article, it is well to call attention to the fact, that there are, no doubt, cases of partial deafness occurring (one seen by myself,) as a result from the same primary cause as the above mentioned impairment of vision. The one seen by myself was cured on the removal of the tooth without any other remedy.

NOTE.—At the request of Dr. Geo. T. Barker, managing Editor of the *Dental Times*, the article is published in this Journal, it being considered of special interest to the Dental as well as Medical Profession.

RICKETS, OR RACHITIS.

BY JAMES TYSON, M. D., PROF. OF PHYSIOLOGY AND MICROSCOPIC ANATOMY IN
PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

There is, perhaps, no systemic disease, except syphilis, a knowledge of which is more important to dentists than rickets, since, being partially curable, it leaves behind it conditions which are constantly influencing the results of treatment in local affections, and among them those of the teeth. We propose, therefore, to present briefly such an outline of the symptoms and pathology of this affection as seems necessary to the information of members of the dental profession.

The disease usually presents itself between the first and second dentitions, indeed, very rarely before the seventh month or after the seventh year. It is generally ushered in by more or less significant prodromata, though these are by no means certain in relation to the disease which they forerun. Among them are placed defective digestion, profuse "yeasty" diarrhoea, sweating of the head, and, according to some, an unusual disposition to cover up the head with bed clothing. Again, muscular atrophy is said, and undoubtedly occasionally does, precede the more marked manifestations, though it is more commonly a result of the same cause. The first decidedly characteristic symptom is, perhaps, *tenderness* of the trunk and extremities, manifested by pain on attempting to move the limbs, by the patient or by others. As a consequence of the resulting unwillingness to be handled, follows a striking quietness, often touching in its significance, and contrasting strongly with any previous disposition to activity, or desire to be fondled. Then follows thickening of the epiphyses, and resulting deformity. Curvatures of the long

bones follow, partly from muscular contraction, but principally at a later stage, or older age, when the child attempts to stand. Fractures also result under these latter circumstances. So long as the child lies quietly upon its back, the latter accident does not occur, and the former seldom presents itself. Curvature of the lower limbs produces the conditions spoken of as "bow-leg" and "knock-knee." That muscular contraction is somewhat efficient in producing deformity, is apparent from the fact that there is curvature and even twisting of such bones as the clavicle, humerus, radius and ulna.

The "pectus carinatum seu gallinaceum," or "chicken breast," when occurring, presents itself early, and more particularly in very young children. According to Niemeyer, it results differently from the other deformities, being the consequence of diminished resistance to atmospheric pressure at the points of union between the anterior ends of the ribs and the costal cartilages during inspiration, while the firmness of the sternum enables the latter to resist and remain prominent. It is not until late in the disease that curvature of the spine and pelvic deformity occur, induced only by the superincumbent weight of the body in the sitting posture.

The flat bones of the skull become thickened, while the fontanelles remain open, frequently until the children are two or three years old. Imperfect ossific deposits also occur in the bodies of the bones of the head and face, producing characteristic deformity of these portions.

Occasionally the flat bones of the skull, and more particularly the occipital bone, become thinned as the result of persistent pressure in the recumbent posture, and it sometimes happens that there is complete loss of osseous tissue, so that the periosteum actually comes in contact with the dura mater.

The maxillary bones are involved in these changes, the teeth falling from their sockets, and occasionally also in the lower jaw, a thinning is noted similar to the cranio-tabes, as a consequence of which it is sometimes perforated by the milk teeth. Moreover, the teeth are cut late, rickety children being often a year old before a tooth presents itself; while it must also be remembered that children in no way defective not uncommonly do not have a tooth until they are a year old.

The condition of the bones of the head in no way interfere with the development of the brain, while the remainder of the body is generally dwarfed. So that there results a head disproportionately large to the rest of the body; while the constant intercourse of a child, thus invalided, with those older and more intelligent than children of its own age, causes a corresponding functional development and an intelligence often surprising to those about it. Moreover, a rachitic condition induced, the

skin is almost constantly hot, the pulse frequent and respiration quickened—in other words there is more or less constant febrile excitement in which the usual brilliancy of the eye attends. Hence we have in connection with the precocious mental development, a condition not unnaturally attributed to hypertrophy of the brain, but more satisfactorily accounted for as above.

It has been stated also that rachitic children are prone to chronic hydrocephalus. Certain it is that they are very apt to suffer with bronchial catarrh, and resulting pulmonary collapse, laryngismus stridulus, indigestion, obstinate diarrhoea with stools offensive and deficient in bile, while the constitutional condition is one entirely analogous to those which are said to develop albuminoid degeneration of the liver, spleen and kidneys. It has been well determined that the urine contains excessively from four to six times the normal amount of phosphates which occasionally aggregate to produce calculi. It also occasionally contains an excess of lactic acid.

If the children be older, say from two to three years old, the prodromata described do not occur, nor are the tenderness and pain so great, being perhaps only manifested when a fall occurs, or a misstep is taken. Moreover, instead of the thorax presenting the first manifestations of disease, the lower extremities are apt to be first affected, for the reasons stated.

The assertion of Guerin, generally received, that there is an order of selection in the development of the disease—1st, in the bones of the legs, 2d, of the thighs, 3d, of the fore-arms, 4th, of the arms, and 5th, of the trunk, is denied by Niemeyer, nor has our own experience detected any such order as constant.

Pathology.—For our knowledge of the pathological histology of this affection, we are much indebted to Virchow. Consisting primarily in a rapid proliferation of the cells of the cartilages of the epiphyses and of the periosteum of the shaft of the bone, and secondarily, in imperfect ossification of the centres thus produced, the phenomena appears to us evidently of an inflammatory nature. The increased vascularity, resulting proliferation and attendant febrile movement imply this. This is also the view of Niemeyer. Virchow believes that the retarded ossification is due to the diminished supply of chalky salts, adducing, in support of this, the evident advantage of these salts in the treatment of rachitis. The presence of the acknowledged excess of phosphate in the urine, is better accounted for as the result of the inflammatory processes, since it is but reasonable that the consequent disturbed circulation should interfere with such deposit, and that the phosphates should consequently re-appear in the urine. Herein we have a distinctive feature of *rickets*

as distinguished from *mollities ossium* of adult life, in which we have an absorption of salts previously deposited, instead of a deficient deposit.

As to its *cause*, rickets is clearly a disease resulting from defective assimilation; however, this may be primarily induced, whether by deficient food, impure air, or other attendants of poverty, or hereditary influence. It is said to occur in the children of unhealthy parents, or of those who indulge in venereal excesses, though the disease itself is clearly not hereditary.

As to *prognosis*, rachitis is by no means always a fatal disease, for although very young children are apt to perish, those of two or three years or older many times recover, almost as often however retaining some deformity, and we fear, quite invariably remaining defective in nutritive and reparative power throughout life. Death much more commonly results from its complications, while undoubtedly the mortality of the ordinary diseases of childhood is much increased by the presence of the cachexia. If recovery is to take place, the extremities and trunk become less tender, the enlargement about the joints disappears, and the normal deposit of calcareous salts takes place. As stated, however, the deformed shapes of the bones is often retained, while they assume their proper degree of hardness, resulting in the permanent deformity alluded to, of which the more serious results are seen in the difficult labors of women.

The indications of *treatment* are clearly to correct first the intestinal conditions which are primarily attendant, and if they do not constitute the exciting causes. While doing this, we can also supply the elements from whose defect the softening and deformity result. But from the view of the pathology which we have assumed, it is clear that the processes of nutrition must be corrected before these can become available. In producing effect, cod liver oil and iron are perhaps the most efficient remedies, and combined with wholesome fresh animal food are often successful. Where there is simply deficient supply of the elements of bone, in connection with the cod liver oil, may be used preparations of the phosphates of lime, iron, soda and potassa, as the chemical food of Parrish and other pharmacutists. The resulting muscular atrophy might be advantageously treated with frictions, salt bathing, and even the electrical current after the bones have commenced to assume a natural hardness. In the softened condition powerful muscular contractions, however induced, would contribute to produce deformity. Much may be accomplished in averting deformity by cautiously handling children who may be the subject of this affection, avoiding pressure in one position, or too long occupation of any posture either standing or sitting.

MORBID EFFECTS OF FIRST DENTITION.

BY JAMES FREDERICK BABCOCK, D. D. S.

A little child has been born into the world: many kind and affectionate friends have wished the tiny life a warm and hearty welcome, but scarcely has the little stranger become accustomed to that haven of infantile rest, its mother's breast, ere it meets and grapples with its first great sorrow, in the morbid effects of its first dentition; and truly, it may be said, that the pathway of its newly found life is obscured by a veil of tears, which have sprung into existence in the vain effort to give relief to its great agony—an agony almost greater than the little body can bear; and yet dentition is not, in itself, a morbid process, but, on the contrary, it is a healthy physiological act.

It would, indeed, be strange had the Creator of our being wilfully—as it were—designed that such suffering should be inflicted upon an innocent babe, and that the disorder of function, together with the serious and fatal consequences which sometimes follow as the direct result of the child's first dentition, should be inevitable.

The fact really is, that when performed in the normal manner, as is most eminently illustrated in the lower animals, the cutting of the teeth is effected without pain or any other evil; and many infants, when assisted by the favorable circumstances of good health and a sound constitution, do thus fortunately pass through the usually trying ordeal—both to mother and child—unscathed; but far more generally, however, the child experiences more or less suffering of a local kind, and oftentimes the pain is attended by a sympathetic irritation of a serious and it may be fatal character, and notwithstanding the greater preponderance of instances of painful dentition—which to the non-professional are naturally considered as an inevitable necessity—still they must be looked upon as thoroughly unnatural and purely morbid changes of the healthy and regular process. Accepting this as the actual fact, the question will naturally present itself to our mind—why, then, are such a large majority of the instances of first dentition either more or less painful? and why are the consequences so frequently of such a fearful character?

The truth is, that a large number of children are born into the world so feebly constituted that they are incapable of maturing; this fact is sufficiently demonstrated by the absolutely frightful percentage of mortality among children in large cities; many others, though born with a sufficiently healthy and vigorous organization, are reduced by unsuitable diet and careless defective management to a condition which readily yields to irregular or morbid agents.

A child may also appear for a time to be entirely free from any un-

healthy indications and yet be very feebly constituted, which will inevitably be shown by the development of various morbid phenomena when the vital powers come to be tested, either by accidental or physiological demands upon their energies. Now, dentition demands a certain amount of constitutional energy to accomplish it without any unfavorable symptoms, and as this demand is one of the severest tests of the organic completeness in a child, many will not bear it.

There are those who, casting aside this fact of the necessity of sound constitutional development, in order to insure the healthy, or normal process, in the eruption of the teeth, have attributed the pain and its many collateral evil effects to the simple pressure of the advancing tooth or teeth upon the nervous system of the gum structure; but those who accept this theory as the real and only explanation, cannot have considered that were such the case in reality, *all* children must inevitably suffer pain, since in the eruption of teeth—no child can be an exception—they all must necessarily press upon the gum; this we know is in nowise the case, for though all children encounter the pressure, all do not suffer the pain, but, upon the contrary, many children cut their teeth without the slightest perceptible inconvenience.

On the other hand, it would be the height of absurdity in us to deny that the pressure of the tooth, during the process of eruption, upon the nerve fibres in the gum structure could not possibly cause pain, for that would be equivalent to the statement that this highly sensitive tissue was devoid of sensation; but that the sometimes intense pain *depends* alone for its severity upon the presence of nerve fibres in this tissue, we cannot for one moment believe, for although there may be, and undoubtedly is, a vast difference in the degree of sensibility in the various gum tissues of different mouths, still, it cannot possibly be great enough to account for the differences in the various forms of dentition, ranging from that of healthy and simple to that of complicated and dangerous. Were the pain alone dependent upon the pressure exercised upon these fibres, and that comparatively simple pain *all* that the little child had to encounter, there would be little need, indeed, to record the many deaths which have occurred through the development of various morbid phenomena directly dependent upon the child's first dentition; in fact, it would require an intensely vivid imagination to imagine that any serious morbid manifestation *could* occur as the result of first dentition, even in a not well developed child, simply because, and dependent upon, the pressure on these delicate fibres solely; but even were this tissue entirely devoid of the nerves of sensation, it is not denied but that it may act as an indirect agent in causing pain, for one of its principal characteristics is toughness—though to a very varied degree in various mouths—and therefore, if possessing this

characteristic in an abnormal extent, it may *resist* the passage of an advancing tooth sufficiently to produce pain in other portions of the highly sensitive organization of the jaw, by diverting the development of the tooth from its normal direction backwards, and consequently engender an abnormal pressure upon the periosteum of the root, or roots, and alveolar socket, together with the pulp of the tooth itself, thereby producing more or less suffering of a local kind; but ordinarily these effects are not serious in themselves; in fact, never are they so in a well and thoroughly developed organization, for infants so constituted are capable of enduring considerable pain; but in the constitutionally feeble child all these phenomena may present themselves, and in the eruption of several teeth at once the demand upon the system is greater than can be readily met, and the suffering will prove too great for its sensitive and sympathetic nature when constitutional disorders may be produced.

At this period of the little one's life the nervous and vascular systems are remarkably active; the several organs have to perform not only their functions, and the preservation of their entireness, but also rapid growth; animal life is exalted with all its various qualities, among which are sensibility and sympathy, or the capacity to be impressed and to propagate impression; hence, a cause, perhaps slight in itself, may produce great local or constitutional disorder, apparently much out of proportion to its own intensity or importance, and from such disorders, directly dependent upon the power to propagate impressions received from the process of the eruption of the teeth during the child's first dentition, serious and fatal consequences may follow, but never, simply *because* of the pain, which has for its basis, pressure upon the nerve fibres in the gum tissue of a constitutionally sound and healthy child.

I think that we have now demonstrated that the theory of painful dentition—represented by some as dependent upon the presence of nerve fibres in gum tissue—is incorrect; and also the fact that any form of painful dentition is an unhealthy one and may be termed a disease.

The symptoms of healthy dentition are not remarkable, and except from the self-evident proof of the occasional appearance of a newly erupted tooth, the mother is scarcely aware that her child is thus favorably passing through the usually most dreaded period of its babyhood.

An apparent increased secretion of saliva is usually noticed, though it is somewhat doubtful if there be much, or any, real increase; the mouths of infants are usually well supplied with fluids, and as they are devoid of teeth, which very materially assist in retaining these fluids in the mouth, it trickles out in large quantities thereby, giving rise to the impression that its secretion is much greater than normally.

The infant is observed to carry its fingers to its mouth very frequently,

and seems to experience much gratification if allowed to press some resisting substance between its gums; gentle friction of them also seem to afford the child much pleasure; and as nature is invariably a correct and sure guide to her own wants, it evidently is natural for the child to endeavor to allay the sensation of the gums at this period, and therefore must be perfectly proper for it to do so.

It is common to alleviate these little inconveniences by giving the child a crust of bread or something similar to press upon with its gums. One would naturally fear, however, that such continuous pressure might eventually condense and harden the tissue, thus rendering it much more impenetrable than before, and inasmuch as nature has not indicated any precise degree of hardness necessary to accomplish the desired object, it would be well to select something which does not possess this quality to an unnecessary extent.

The French use a stick of marsh mallows, or liquorice root dipped in honey, or a sweetened decoction of barley. The Germans, a small bag filled with sugar and spices; but it is very doubtful whether the success of these substances in quieting the child may not induce the mother or nurse to neglect it, and thereby deny it the breast, which it would otherwise eagerly and frequently take.

Nothing so soothes the infant as the frequent lubrication of its mouth with its mother's milk, and where there is nothing in the state of her health or the condition of her breast to forbid this indulgence, it is cruel and unnatural to withhold it.

It may be, too, that such constant use of sweet and condimental substances would disorder the stomach of the child, an accident to be studiously avoided during teething.

The bowels are generally at this time looser than usual, and although the purging may be very frequent, still, it must not be deemed excessive so long as the child nurses freely and does not emaciate. Costiveness is very much more to be dreaded during dentition than frequent passages, for it is unnatural, and unless measures be immediately taken to correct it, it may terminate in irritations, either local or sympathetic, which cannot be easily remedied.

The child may also manifest considerable restlessness, and perhaps sleep less profoundly than usual; these symptoms of a healthy dentition may, and usually do precede the eruption of the teeth for several weeks, when after a few days they will subside, to be renewed when the teeth are pressing forward and about to enter the gum.

Such are some of the symptoms of a healthy dentition, and now, in contradistinction, let us notice the diseases or morbid effects of first dentition.

When dentition becomes complicated with morbid conditions, either

directly or indirectly, the management of it requires far more care and skill ; the local symptoms are to be allayed, symptomatic affections are to be relieved, and the strength of the child supported through a long and tedious process, in which the powers of its system are taxed to their utmost.

Such diseases may be termed in their division local and sympathetic ; local, those which affect the gums, teeth, and mouth ; sympathetic, those which manifest themselves in other organs.

First among the local symptoms we have inflammation of the gums, which are very sensitive, redder than is natural, swollen and hot ; the child shrinks when you attempt to touch them, and incessantly craves the breast or cold liquids.

This state of affairs is almost always attended with more or less fever and irritation of the intestinal canal ; the face is flushed, the head hot, the eyes red and watery, the flow of saliva profuse, and sometimes the salivary glands become tender and swollen ; the fever is generally severe while it lasts, rising and falling with remarkable rapidity ; the thirst is very great, and the sleep of the child is uneasy and frequently interrupted by starts and screams, and when awake is alternately fretful and stupid.

These symptoms are often very quickly allayed by freely incising the gum and capsule down to the teeth, and liberating them from their investments ; this operation is usually of much benefit whenever the gum is elevated and distended ; should it be of no relief, it would either be because it was not effectually done, or the pain to be relieved did not depend upon the mere mechanical resistance of the gum for its origin.

Many a mother considers this little operation as a most formidable one to be performed upon her child, and did we practice it as the French do, by a dissection of the gum, it would, indeed, be no trifle ; there is no necessity whatever for such cruel work ; a simple incision with a lancet, carrying it down until its point grates upon the advancing tooth, is all that is required ; the bleeding which results is very trivial, and of much assistance in allaying the inflammation of the gum.

There are those who object to this operation, advancing as an argument, that when the wound is healed the cicatrix will present an obstacle which will act with more resistance than the original tissue.

In reply to this objection, it will only be necessary to state, that mucous membranes are the most tenacious, and yield less readily to pressure than any other tissue in the body ; while the organized lymph, of which this cicatrix is formed, is very readily absorbed, consequent upon the pressure of the advancing tooth ; in fact, easy absorption is one of its peculiar characteristics, wherever found.

Together with the free use of the lancet, attention should be given to the bowels of the child ; if costive, their torpor should be relieved by the

proper use of purgatives, and if too loose, medicine should be given to check the diarrhœa; as the bowels of the child return to their normal condition the fever will generally abate.

The cold bath, or sponging with cold water, will be found to be of much assistance in reducing the fever and restlessness, but far and above all, pure country air and plenty of out-door exercise, will be found to be the great remedy with which to combat successfully the disorders attending dentition.

We have now mentioned some of the local effects of a morbid dentition, but were we to mention those of a sympathetic nature, which are said to be the result of teething, we should undertake the recitation of a task of great magnitude; hence, we beg leave to decline for the present, simply saying that while many of these, said to be, sympathetic diseases undoubtedly do occur during the period of dentition, still, it by no means follows that they are a necessary consequence.

Others are undoubtedly the direct result of dentition, and if recognized as such may be treated with the best results, which, if neglected or improperly treated, may terminate fatally.

STOCKTON, CAL.

ON AMALGAM.

BY DR. JAMES LEWIS.

From my earliest recollection, the Eclectic school of medicine, (as the botanists delight to be called,) have denounced mercury as an unsafe, aye, as a deleterious medicine. Homœopathy and hydropathy, also, contribute their quotas to the same denunciation; and though they have repeatedly demonstrated their hypothesis to their own satisfaction, mercury, in the form familiarly known to physicians as submuriate, (Hy.Cl.,) continues to be the *sheet-anchor* of medical practice.

From my earliest acquaintance with dentistry I have been perplexed with the discussions relating to amalgam. Perhaps I have been unfortunate in never having found any peculiar conditions of the mouth that could, by the most remote possibility, have been attributed to the influence of mercury derived from an amalgam plug. I have examined a great many teeth that have been filled with this material, and when I have found the parts around them diseased, the origin of the difficulty was so entirely referable to conditions in which mercury was not involved, that to intimate mercurial disease would be unpardonable presumption. There are, undoubtedly, instances in which, on account of a peculiar diathesis, a patient is intolerant of mercury in any of its forms, (except as administered homœopathically—in which case a mathematical “differential” may be placed as the co-efficient of the *quantity used*.) I have never, in dental

practice, seen a patient possessing this peculiar diathesis. I will admit, however, that for such a person an amalgam plug, under certain conditions, *might* be a dangerous thing. We find persons who are also intolerant of opium and its various alkaloids. We do not, on that account, *forbid* the use of opium to those persons who have no such idiosyncrasies; and when we have a patient who will bear calomel, its use, in given cases, is to be recommended, not condemned. To go back for another illustration: If we deprive ourselves of a useful agent, because the ratio of its *dangers* to its *utility* may be as 1 to 100, or even more, we might, with propriety, insist upon the abandonment of ocean steam navigation, for the reason that, occasionally, a vessel is so irrevocably lost at sea that even the "spirit mediums" fail to render an account of the fate of its passengers.

Much of the argument against amalgam and its uses is simply *specious*. Writers who delight to ventilate their ideas on this subject unconsciously pervert many of the most important facts and principles involved in our knowledge of electro-metallurgy, and their *speculations* upon the probable manner in which electric or electro-chemical forces manifest themselves in the human mouth, in connection with the substance of the teeth and of amalgam, show, to one who has patiently studied the laws of electro-chemical force, that they, (the writers,) have not yet reached even a tolerable comprehension of the subject; and when we come to consider their ideas of the pathology of the subject, we shall find, on careful scrutiny, that in some cases there is a palpable error of diagnosis, in others a disposition to condemn a substance, which, being injurious in one case, may be the *best* that is available in ninety-nine others.

I do not *advocate* the use of amalgams. I am just enough conservative not to deprive myself of a useful agent on account of a *prejudice*. At one time I was considerably influenced by the appeals of writers who sought to create a *prejudice* in the minds of the profession—(the writers themselves being evidently prejudiced)—and, for a considerable time, I argued with my patients to induce them to forego their use. It is scarcely necessary to say that this mode of doing business did not prove satisfactory, and I was *obliged* to use amalgam. Since that period I have studied amalgams with much interest, and in this connection I have also considered them as agents for the development of electro-chemical force, and their possible relations to the teeth, and to plugs of other material in the same or contiguous teeth. Probably some of my readers know the *secret* of the *white* amalgams. The best of them have the silver alloyed with *cadmium* or *zinc*. For certain electro-chemical reasons, zinc is preferable. The part that zinc plays in the compound is to protect the silver and mercury from the oxidizing influences of the fluids of the mouth. Zinc being the most highly electro-positive of any of the metals that can be used in such

preparations, commends itself on the electro-chemical theory as an important adjunct in amalgam compounds.

Perhaps it may not be out of place to give my mode of preparing amalgam compounds. This I will endeavor to do as succinctly as possible, with my *reasons* for each particular. I prefer *coin silver* alloyed with *copper*. The presence of *copper* insures a greater degree of *hardness* than is attainable when it is absent, and in the presence of zinc it is as fully protected from electro-chemical action as the silver or mercury is. I melt the silver, and if it be chemically pure I add copper, about 8 per cent., to the argento-cupreous alloy. I add, while in fusion, zinc, about 5 per cent., after which the metal is cooled as quickly as possible. The alloy is then reduced (by means of suitable cutters secured on a mandrel in a lathe) to fine cuttings, which are afterwards passed through a very fine screen or sieve of brass wire gauze. To this I add also about 5 per cent. of *similarly screened cuttings* of *metallic zinc*, which helps to impart the necessary electro-positive character to the mass. Finally, I add from 50 to 80 per cent. *chemically pure silver* in *atomic division*, regulating the amount empirically, as it seems to be needed on testing portions of the mass from time to time.

I prepare my chemically pure silver by dissolving refuse silver, scraps and old plugs of amalgam in nitric acid. Filter the solution; add sufficient hydrochloric acid or chloride of sodium to precipitate all the silver as chloride, which chloride should be rapidly and thoroughly washed by frequent changes of pure water. The reason why I use chemically pure silver in atonic divisions is this: The *cuttings* of silver, no matter how fine, will have appreciable interstices between them, and an amalgam prepared from fillings or cuttings alone will inevitably become porous by the process of saturation—the little fragments of silver being at first simply *coated* with mercury, finally absorb more, which necessarily drains the interstices. If, in the preparation of an amalgam, we can introduce some substance which will not greatly disturb the homogeneousness of the mass, and which will displace as much mercury as possible, we shall have secured two advantages. First, we obviate porosity. Second, we have to use *less mercury*. And in the result we obtain a *condition* of the mass in which mercury is obviously not available to the extent observed in some other forms of amalgam, for the production of such salts as may act prejudicially upon the tissues in the vicinity. In such an amalgam as I prepare the mercury cannot be twenty per cent. In a plug weighing five grains, we would find less than one grain of mercury. Allowing as large a surface of exposure as possible, which very seldom would reach as much as 0.25 square inches, the query arises: What fraction of a grain of mercury can possibly be absorbed from this mass in a given time? and

if it permeates the tissues as a *soluble salt*, how does it reach them? Is it through ingestion after undergoing solution in the mouth by the action of perverted saliva, or does the mercury in a metallic form pervade the structures of the tooth, or does it undergo solution in fluids pervading the tubuli of the teeth, and then find its way slowly into the adjacent tissue? We may declare our *opinions* on these points, but that is *not* demonstration. As I said before, much of the reasoning on these queries is too *specious*, and it seems to me to assume the character of *special pleading* to sustain an *a priori* hypothesis. The chloride is then covered with water, say half an inch deep, sufficient sulphuric acid and metallic zinc being added to insure the reduction of the chloride to pure silver. When this is fully accomplished, as may be known by the entire disappearance of the white chloride, and the flakey or granular appearance of the dark metallic silver, the zinc may be removed, and the silver remain a few hours in contact with the unappropriated sulphuric acid to insure the solution of any remaining undissolved portions of zinc. The silver is finally to be thoroughly washed with clean water, until *clean*, when it may be squeezed dry, or nearly so, in a napkin, after which it may be crumbled with the fingers, and more completely dried on a metallic plate over a lamp.

A few words relating to my mode of using this amalgam may not be out of place. Let the cavity be as carefully prepared as for a first-class gold filling. If the pulp cavity be endangered by the pressure necessary to insure a firm filling, cap with *osteoplastic*, or in any other mode that will secure permanence and security, dry the cavity by removing surplus saliva with a syringe, completing the process with any of the absorbents usually applied for that purpose. But, before the final drying of the cavity, mix the amalgam, and while it yet has a surplus of mercury, wash it with pure water, to which a few drops of ammonia (alkaline) have been added, until the amalgam is *perfectly clean*. Remove surplus mercury by squeezing in a napkin, or any other convenient, suitable material. The amalgam is now to be packed firmly in the carefully dried cavity, using a surplus, in order to take up and remove the free mercury forced out of the mass by condensation, taking care that this part of the operation is thoroughly and efficiently performed. Dress the surface of the plug to a *contour*, and burnish it. After the plug has become somewhat hardened the burnishing may be repeated until the surface remains bright and smooth. Plugs of this character, in an average mouth, retain their brightness and seldom discolor a tooth—the *vitality* of which is sufficient to retain a plug of other material.

In *dead teeth* discoloration is very liable to ensue. This may be explained by attributing it to the evolution of gases containing *sulphur compounds*, which, it is known, are often evolved in appreciable quantities,

from the decomposition of organic substances, and more especially those of animal origin. I have omitted to enlarge upon some points in my remarks, where it appears to me facts and reasons are so obvious as to suggest themselves.

In the amalgam question I do not propose to enter at large. Most of the discussions that are likely to arise in considering a subject in which the theory and practice of different persons is as different as can be, argument is so liable to degenerate into controversy, that the *main point* is lost to view in an endeavor to silence an opponent. A writer may sometimes be too busy or *too indolent* to fight his way out of a discussion, from which he will emerge without having achieved anything but opposition. In this matter I think I may claim the privilege of my age to plead an excusable amount of indolence.

MOHAWK, N. Y.

A CASE IN PRACTICE.

BY E. F. BARNES, D. D. S.

A short time ago a patient called on me to have a tooth filled, the left superior canine, decayed badly upon the approximal and labial surfaces. After removing the remaining portion of the old filling, I found an opening to the pulp cavity, but was devoid of any portion of the pulp. This state of affairs led me to question the patient in regard to it, who told me that six years ago a dentist in Liverpool had destroyed the pulp and filled the crown cavity, but did nothing whatever to the root—had experienced no trouble from it till about five months ago, when there commenced a slight swelling and severe pain at the root of the tooth, but was quietly dispelled by some antiphlogistic treatment and no further thought was given it. I removed all foreign matter, and treated with carbolic acid, and closed firmly the opening I had made, as I feared if I left the cavity exposed, it might cause an irritation and serious difficulty. A like case I very distinctly remember coming under my observation a few years ago, which resulted in alveolar abscess and partial necrosis of the superior maxilla. But to resume my case in practice.

The patient called the following morning to tell me the tooth commenced to ache soon after I closed it up, and continued to ache all night. I removed the stopping supposing the pain would cease, but, instead, it ached more violently than before.

I cleansed the tooth thoroughly with chloride of sodæ, and closed it up again without using carbolic acid. The pain was somewhat lessened but not entirely checked. I then painted the gums with *Tr. Iodini*, and in a short time the pain ceased altogether and has not returned.

In a few days I treated it again with the chloride of sodæ, and in about

a week filled the root with Hill's stopping, covering with oxychloride of zinc, first cleansing with carbolic acid, and filled the crown with gold.

I am at a loss to know what was the cause of the pain when I opened the cavity, whether it was caused by the carbolic acid, or in leaving it exposed to the atmosphere, as it was for a short time.

An idea a brother gave me, is, I think, a good explanation of the cause of such trouble.

The decomposed matter confined in the root lies dormant till exposed to the surrounding atmosphere, when it undergoes a chemical change, thereby causing an irritation of more or less magnitude.

I think if every portion of the decomposed pulp and all particles of foreign matter were carefully removed, and the pulp cavity thoroughly cleansed, there would be no irritation and consequent inflammation.

If we understood the cause of disease, we would be better enabled to treat successfully those cases which come under our observation and care.

NEW YORK.

CHLORAL-HYDRATE.

BY WILLIAM C. BAKES.

So much has been said and written in regard to the therapeutical and chemical properties of this new remedial agent, that there may seem but little more to be said in relation to it. We shall, therefore, only mention a few of its characteristics, and suggest the most convenient modes of administering it, with a view of securing its effects as a hypnotic and anæsthetic. Mr. E. Schering, of Berlin, who has manufactured it on a large scale, makes the following statement:—Chemically pure chloral-hydrate ($C_2Cl_3OH + H_2O$), forms white acicular crystals, has a peculiar pungent odor, a somewhat bitter taste, produces, in concentrated solution, a slight irritation in the throat, fuses and sublimes readily, and keeps well in glass stoppered bottles—even in aqueous solution. In dispensing, glass, porcelain, or silver utensils, are to be used.

It is readily soluble in distilled water; only after contact with the atmosphere, traces of hydrochloric acid are discernible, which must be carefully neutralized by ammonia, if the solution is to be used for subcutaneous injections.

In a pamphlet issued by Dr. O. Liebreich, the following formulæ are given for administering chloral-hydrate:—

R.—Hydratis chlorali, 38 grs.;
Aq. destil,
Mucil. acaciæ, aa ʒss.—M.

S.—Take at one dose. (Ordinary hypnotic.)

R.—Hydratis chlorali, 62 grs.;

Aq. destil,

Syr. aurant., āā ʒss.—*M.*

S.—A tablespoonful at night. (Ordinary hypnotic.)

R.—Hydratis chlorali, ʒss;

Aq. destil, ʒiv;

Syr. aurant.,

Mucil. acaciæ, āā ʒss.—*M.*

S.—A tablespoonful every hour. (Sedative.)

Other formulæ have been used with success, and some physicians have obtained good results from the syrup of chloral.

R.—Hydratis chlorali, 160 grs.;

Aq. destil, ʒiv;

Syrupus, ʒiij, ʒij;

Aq. flor. aurant., ʒij.—*M.*

S.—This may be given in doses of one teaspoonful or more.

A preparation less sweet than the syrup, pleasant to the taste and pleasing to the eye, is found in the elixir of chloral.

R.—Hydratis chlorali, 160 grs.;

Aq. destil, ʒi;

Syr. aurant. rubr., ʒiij.—*M.*

Chloral-hydrate is also used for subcutaneous injections, and may be dissolved in distilled water in suitable proportions.

PHILADELPHIA, PA.

Dental Associations.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a meeting of the Association, held September 17th, 1870, Dr. Wm. Trueman exhibited a superior lateral almost cut through by a gold clasp. This clasp, assisted by one around the canine of the opposite side, supported a gold plate with four teeth. The tooth was worn away so as to resemble very much the letter Z; the crown and root being connected by a perfectly polished shaft, scarcely the sixteenth of an inch in diameter; the pulp cavity was completely filled up by a deposit of secondary dentine.

This wearing away had been accomplished in two years, though it is possible that the obliteration of the pulp cavity had been going on for some time, as the tooth had been much worn by mastication. It had never given any pain.

He thought this result was produced almost entirely by mechanical means. From the position of the clasps, the case was not held perfectly firm; every movement of the jaw causing considerable motion, especially about the tooth, wearing a groove nearly three times as wide as the band. The lateral had been banded merely as a temporary expedient.

The smooth polished surface is seldom, if ever, seen where the plate is held firmly in position and the tooth injured by chemical agencies.

In this case, the perfect polish, and the knowledge that a constant attrition between this tooth and band has been kept up for two years, lead us to regard this as a specimen of mechanical injury. The fact, that an examination of the gold clasps gives no evidence of wear, after having cut through a large surface of enamel so much harder than itself, leads, in the absence of any other explanation, to the supposition that some form of chemical action has assisted in the destruction.

He had recently noticed the screw-threads on the steel mandrel of his polishing lathe, although tempered quite hard, and in use only four years, nearly worn out, while the brass screws, used to attach the brushes, had not suffered in the least, although made at the same time. In this case it is most probable that the polishing powder became imbedded in the soft brass. When they are screwed in, the attrition is confined entirely to the steel.

Dr. James Truman considered the wasting of surfaces in contact with clasps, to be almost entirely due to chemical action. The result of mechanical wear by attrition must be comparatively small. That such exists, in combination with the chemical, there can be no doubt. In his judgment, the clasps held the oral secretions in contact with the tooth. The necessary result of this was an accumulation of acid fluids, and a speedy separation of the lime salts from the tooth. In mouths where abnormal acid secretions exist, this result will be very rapid. The space left by the removal of the tissue will generally assume the size of the clasp, naturally leading to the inference that the loss has been occasioned by the wearing process. The same result may be, and is produced, by the overlapping of fillings, where not the slightest motion exists. The change of secretions from their normal condition is painfully evident where a filling has been left in an unfinished, ragged condition for a few days. The sensitiveness will be found to have greatly increased at the edges of the cavity. This condition, in the short time intervening, can only be accounted for in the change of the secretions deposited under the rough and over-hanging portions, irritating the sensitive tissue in the dental tubes by their acid character. If this be long continued, loss of substance will result.

In the specimen exhibited, the pulp canal has become entirely obliterated

by deposits of secondary dentine. There is nothing remarkable about this, as it is the same process that follows the wearing away of teeth, the deposition found in the dentinal tubes at the approach of slow caries, or the hypertrophied condition termed exostosis. Wherever a slight irritation exists in or about a tooth in full vitality, there will be more or less extra deposits; but for this protective shield thrown up by nature, many teeth would be lost that are otherwise rendered useful and comfortable.

Dr. Wildman believed the destructive effects were mainly owing to the action of acid secretions, or by acid formed in the decomposition of particles of food finding lodgment between the clasp and the tooth. This, combined with the mechanical movement upon the tissue, weakened or partially disintegrated by the chemical action of the acid, would satisfactorily account for the rapid destruction of the part of the tooth so encircled.

The older members present will remember that some twenty-five years ago narrow bands were used. These were simply half round wire, turned with the flat side to the tooth and clasping it. To this the artificial teeth were attached. When broad bands were introduced, there was a feeling of confidence that the destructive effect of clasps would, by their use, be obviated, as they would embrace the tooth to such an extent as to prevent motion of the denture, and, consequently, the wearing away of the tissue by attrition; but it was soon found that the destructive effects of the broad clasp was as great as that of the narrow, giving evidence that it is mainly chemical action that causes the destruction of the tissue.

Dr. Githens objected to the general condemnation of clasps. Many teeth were not affected at all, either mechanically or chemically—the instances of great loss of tissue by this means being exceptional.

WHALEBONE RUBBER.

In answer to a question of Dr. J. Truman, in regard to "Whalebone Rubber:"

Dr. Wildman remarked that, at the request of the agent of the manufacturers, he had made some experiments with it. With his thermometer it was hard, but not perfectly elastic, when vulcanized according to their directions, viz: 55 minutes at 320° F., but when kept at 320° for 70 minutes, this property was fully exhibited. Thin strips, the thickness of the sheets, an inch broad and three inches long, if held firmly at one end, and the other bent at an angle of fifty degrees, would, if freed, instantly resume its shape, proving the rubber to be very elastic.

He had not tested its actual relative strength with the ordinary red rubber, but believed it much stronger. Its greater elasticity enabled the operator to make it much thinner. He had made an obturator of it in a

case where thinness, strength and elasticity were necessary. The plate was made very thin and was very elastic, and so far appears to be a complete success.

He did not know of what the coloring matter consisted, but was assured by the agent that it contained no vermilion. If mercury existed in it, it could be readily detected. After being vulcanized, the color is very similar to compounds he had made by substituting red oxide of iron for vermilion. When the bright rouge or oxide of iron was ground in linseed oil, previous to mixing it with the caoutchouc and sulphur, before vulcanization, it was much darker than the whalebone rubber, but when hardened the color was the same.

Dr. Jas. Truman had experimented with it to some extent, and so far as he could judge it was much tougher than the ordinary red rubber. The color, in his judgment, was no objection, although much darker than generally used. Plates could be made very much lighter, and still retain all the requisite strength. It could be used to repair the red rubber to great advantage. The disfigurement, produced by unequal vulcanization, is obviated by the dark color of the whalebone rubber. The difference in shade between the two is very slight.

Dr. Pettit was not satisfied that this rubber was free from mercury. He understood, from conversation with the agent, that a small portion of vermilion was added to the coloring matter.

ROLLED GOLD.

Dr. Wm. Trueman desired information in regard to rolled gold, or what is known as "Pack's Gold."

Dr. James Truman, in answer, stated that he had used one box of this gold, but did not feel prepared to give a decided opinion for or against. When he first commenced its use it was with feelings strongly prejudiced in its favor; but from some, as yet unexplained cause, it did not fulfill his expectations. The cohesive property seemed perfect, the gold was very soft, yet it was difficult to secure a perfect union of the lamina of foil. Yet, notwithstanding the repeated failures to make a satisfactory filling with this form of gold, he was still of the opinion that this mode of preparation had value, and would yet be made available for our purposes.

This form of gold is, however, nothing new, it having been used nineteen years ago. Through the kindness of Abbey & Sons, he had been able to refer to their letter book, and from that gathered the fact that they had rolled out No. 30 gold for Dr. Arthur as early as February, 1852. They had also supplied *beaten* gold, of No. 15, in 1850, and No. 30, *beaten*, in 1850-'51. At that early period in the use of adhesive

foils, the successful introduction of such a heavy material was an absolute impossibility.

The theory entertained by the two manufacturers of this kind of foil is substantially the same. It is well known that metal in rolling will elongate without lateral expansion; or, in other words, that a wire passed between the rolls will lengthen, but will not perceptibly increase in width. The supposition is, that the crystals, in the process of melting, aggregate together in one direction, and in the process of rolling they are simply extended in length. As long as this is continued in the one direction, the product will be a soft, adhesive material; but any change from this course will break up the cohesive property; or, in other words, derange the crystals. That this theory of the manufacturers is substantially true, seems borne out by results, although there are some theoretical difficulties in the way of its entire acceptance.

In experiments with tin he had found the results the same as gold. The tin came out soft, and the cohesive property apparently largely increased. The same difficulty in manipulation, and the same unreliability, was present as in the denser metal. He had been unable to pack rolled tin at all, unless carefully passed between the rolls in the one direction.

That gold and tin, prepared in this way, can be made useful admits of no doubt, but to what extent remains for further investigation yet to develop.

The inquiry now being made in regard to gold, and forms best suited for adoption, can but result in great good. We have suffered in the past through a want of correct information in regard to the difficulties met with from deterioration of gold, and any light thrown on this subject will be gladly welcomed. Mr. Pack says it is impossible to make an even foil under the hammer; that there will be "papery gold," and harsh, unyielding gold as long as this process is used. This seems reasonable in theory, but it is doubtful whether such results may not legitimately be traced to other causes in the process of manufacture.

Dr. Wm. Trueman had used half a box of "Pack's Eureka Gold," rolling it in cylinders. He had found it to work nicely, but entirely too troublesome. A few months ago he had been shown, by Dr. David Roberts, a half sheet of No. 40 rolled foil, the last of several ounces made to his order by Messrs. Abbey & Sons some twelve or fifteen years ago. The Doctor reserved it for especially difficult approximal cavities, using it in narrow strips or tapes, and thought in those cases it possessed some little advantage over ordinary foil; but it required more care, and could not be worked as rapidly. Although this had been kept so long, he had not noticed any change in its working properties.

J. T.

Editorial.

ON NITROUS OXIDE.

We publish the following letter, which is a type of many which have been received the past few years :

TO THE EDITOR OF THE DENTAL TIMES :

Dear Sir :—I have recently determined to administer nitrous oxide, and have procured a large gasometer, capable of holding 40 gallons of gas over a corresponding quantity of water. I have given the gas several times, but am not quite satisfied with the results. I have administered the gas from a seven-gallon rubber bag with a plain mouthpiece—the patient breathing from and into the bag. I have in many cases had the following symptoms: blueness of the lips, lividity of the countenance, muscular twitching, irregular respiration, and an appearance as if the patient was about to have a convulsion. This condition has in all cases come on suddenly, and, upon removal of the bag, the person has quickly recovered consciousness, and has appeared to suffer no bad after-effects—except that in a few cases there has been a desire on the part of the patient to take every few moments a long breath, as if the lungs were not able to take, in natural respirations, the requisite quantity of atmospheric air. This has, however, passed off in an hour or so after the administration of the gas. In one case the patient, a strong healthy woman of 28 years of age, went from my office well, or, at least, apparently so, but was taken the same night with congestion of the brain—so pronounced by her physician—and continued very ill for some weeks; recovered eventually, but still suffers with “low spirits and headache:” lays her sickness and unpleasant feelings “to the gas.” I would remark that the gas used, in all cases, was *fresh*, and washed according to your advice in your work* and your oral teachings. My object in addressing you is, to ask you if you had met with such an experience. 1st. So far as symptoms detailed during time of administration. 2d. Have you noticed any unpleasant results immediately after its exhibition? 3d. Have you met with, or have you heard of any bad results following the administration of gas, say several hours or even days after, that might be reasonably traced to the ill effects of nitrous oxide? 5th. How long will gas keep useful over water? By answering these questions you will confer a favor, for which I shall tender you my warmest thanks.

Respectfully, yours,
_____.

We take pleasure in answering the above communication, for it enables us to point out to *many* the reckless manner in which gas is administered—the popular idea being, both by dentists and physicians, that gas is perfectly harmless for any and everybody—one operator alone stating that, in “four years,” he had operated on 15,800 patients, which, allowing the average to be four teeth from each individual, would make a sacrifice of 63,200 teeth or roots. But it is not of this wholesale extraction to which

* Barker's Instructions on Preparation, Administration and Properties of Nitrous Oxide. Third edition.

we shall now refer, but shall remark, that the selection of cases for the administration of nitrous oxide calls for just as much discrimination as is required for the administration of sulphuric ether. And the only advantages which nitrous oxide possesses over ether is, that an anæsthetic condition can be more quickly produced by the first named, and that, when properly exhibited, nitrous oxide is more rapidly eliminated, and hence is well adapted for minor surgical operations. In reply to our correspondent's first query we would state, that we have repeatedly seen the symptoms so accurately described by him as occurring to his patients at time of administration, and though not willing to acknowledge to a constitutional timidity, yet can truly say, that we have never witnessed them without alarm; for such symptoms are sure indications of a carbonized condition of the blood, an unfavorable influence on the medulla oblongata and nerves controlling respiration, and a like "reflex" influence on the cerebro-spinal nerves and nerves of the great sympathetic system. Such involuntary movements, happily described by our correspondent "as an appearance as if the patient was going to have a convulsion," are the efforts made by nature to arrest, modify, or give evidence of the presence of some poison or noxious agent that, if not quickly removed, will overthrow vital force. Fortunately, the alarming symptoms are so marked that the operator quickly removes the bag, and while it may be said the patient is on the brink of the grave the teeth are extracted. This assertion may to some seem extravagant, but we do not doubt that *two minutes* of continued administration of the gas, to a person exhibiting such appearances, would induce a fatal termination. Precisely the same results are induced upon the inferior animals, and if continued beyond this point death ensues. But let us see what is the cause of these untoward symptoms. Nitrous oxide, unadulterated with air, a powerful supporter of combustion, is rapidly inhaled into the pulmonary air cells, through which absorption takes place into the blood with great facility. This blood, surcharged with this great combustible agent, is carried over the system, and, as a consequence, combustion occurs between the remote tissues and nitrous oxide conveyed to the immediate neighborhood by the blood, carbonic acid gas being the result, which is taken up and returned to the lungs, where, if no *valved mouthpiece* is used, it is carried by the exhalations back into the bag to vitiate its contents, and cause the pulmonary air cells to contain, in the course of a few inspirations, a poison gas, a mixture of nitrous oxide and carbonic acid gases, the blood at each inspiration becoming more and more carbonized. While, then, these symptoms may result, even when gas is properly administered from a valved inhaler, allowing none of the respiratory product to enter the receptacle from which gas is inhaled, we have yet, in an extended experi-

ence, to meet with such symptoms, and believe *that they are mainly the result of breathing back and forth into small rubber bags*—carbonization of the blood occurring from interference with the endosmotic process in the lungs.

The most bigoted man on the subject of nitrous oxide with whom we ever conversed was an eminent physician of New Jersey, who saw a patient (his wife) take gas at one of the dental slaughter-houses which flourish—to our shame be it said—in all the cities and large towns from one end of the land to the other. This gentleman remarked, that he had never seen one apparently so near death and yet recover. The same lady, on another occasion, took gas from a large gasometer, breathing easily through a tube and valved inhaler, no unpleasant symptoms being present—the countenance, color of lips, expression of eye and hue of skin, respiration and circulation being continuously normal.

We answer question number two by stating, that the involuntary long breaths every few moments were only nature's efforts to overcome excessive waste of parts engaged in respiratory movements, and to supply proper "residuary" air to the pulmonary air cells; or it might be due to the continued presence of an irritant acting by reflex nervous action upon the respiratory nerves. This condition was mainly due to *improper* administration of gas—the person breathing their own exhalations instead of pure nitrous oxide. But there is one objection made by some to the use of the valved inhaler, which we consider should have no weight when safety, comfort and cleanliness call for such a method of exhibition; it is that "patients breathe more gas," and "do not stay so long in a state of narcotism, hence have to administer gas over and over," which is true; but if safety is not to be considered carbonic acid gas might be used, as it is just as rapid in producing narcotism, and the effects would continue longer than when diluted with nitrous oxide.

In reply to question No. 3 we would state, that we have heard of many cases of sickness following the administration of nitrous oxide. Several such cases have been published. We quote one.

"Coma, from Nitrous Oxide.—BY PROF. THOMAS, Bellevue Hospital, Dec. 11th, 1869.—E. McLester, 19, domestic, Ireland, admitted to Hospital 10th December. She was in perfect health up to Tuesday, 7th December, when she took nitrous oxide, from the hands of a dentist, previous to having a tooth pulled. She has been comatose ever since, says there is nothing the matter, but has a distinct remembrance that she had or was about to have a tooth removed, and, from repeated exclamations of "my tooth," seems yet to suffer from it. In answer to questions as to where she is, she replies, "at my mother's." She presents a robust appearance, remains quiet, with a constant tendency to lapse into unconsciousness, from which a considerable amount of shaking is necessary to arouse her. Questions have to be repeated, and elicit imperfect and

unsatisfactory answers. The pulse is perfectly natural. She had double strabismus, which has now disappeared. The face gave the impression of being flushed; but she seemed naturally florid. *Treatment*.—Let her alone until she recovers. I have known a case in which the coma lasted four days. This patient went out perfectly well a few days afterwards.”—*Medical Gazette*.

[Such cases do not always come out of it when let alone. Miss D. Smith informs me that a lady, at Belvidere, took *gas* a few months ago, who was affected in a similar manner, but died on the 3d or 4th day. The dentist who administered it took up his bed and walked, and has not been heard from since. The dental and medical journals relate numerous similar cases. In view of these facts we cannot credit the sweeping statements of Dr. Colton, that his association has administered it in 75,000 cases without accident.]—*The Dental and Medical Journal*.

We would further remark, that we are keeping a record of cases, well authenticated and markedly significant, of bad results from administration of nitrous oxide, and will thank our friends in different sections of the country to forward *such cases* to our address, that they may (without giving publicity to names of patient or operator) be published to warn the dental public against the great error that nitrous oxide can be given to any and everybody. And doubtless many would be surprised at what evidence has already been accumulated.

To question No. 5 we would reply, that we have repeatedly given *gas* six weeks old; and on this day, September 25th, have given *gas* twice from a gasometer filled August 5th—narcotism being in both cases readily and satisfactorily induced in less than two minutes. But *gas* will not keep this long unless the gasometer is perfectly air-tight, and the water should not be removed from the gasometer, unless *gas* is made very frequently, oftener than once in one or two months. We have answered our correspondent at length, though we have not touched upon points which we consider of vital importance. From an extended acquaintance and correspondence with dentists, we believe the *rule* is to use the rubber bag and old-fashioned mouthpiece, and that valved inhalers are the exception. That it is the rule to give *gas* to everybody, young and old, sick or well; but we would urge the most careful discrimination in all cases, rejecting those where doubt exists or where other anæsthetics would be contra-indicated, adopting the remark which has been made of mercury—“That it is a two-edged sword, capable of doing a great deal of good or a great deal of harm.”

G. T. B.

HEAVY FOILS AND THE WHITE METAL Mallet.

Every day's experience convinces us of the value of heavy gold as an adjunct of the lighter foils in filling teeth. We have not used above No. 60, and this only in large cavities, but with the aid of a three oz. white metal mallet, which is preferred by our patients universally to the light

mallet or automatic plugger, we have produced the most satisfactory results. We recognize the fact that this time the "light" traveled from the West toward the East, instead of from East to West, for it was mainly to the public efforts (received at first with derision) of our friends in St. Louis, Messrs. McKellops, Judd & Chase, that attention was directed to the subject, and though neither of them claims to be the author of the method of filling, all articles of any value to dentists having been introduced in some past age—see Dental Periodicals—yet they were the ones to fight the method into public favor.

G. T. B.

THE AMERICAN DENTAL ASSOCIATION.

The annual meeting of this body occurred at Nashville, Tennessee, August, 1870.

There was a full attendance of professional brethren, particularly from the South, the extreme hot weather keeping many away from the North. We believe the selection of officers was a happy one. No more fitting election could have been made than that of Dr. William H. Morgan, of Memphis, Tennessee, to the presidential chair, while the other selections were eminently appropriate. The discussions, we learn, were enjoyed, and doubtless will produce good results. There is one point to which we would direct attention, and which, sooner or later, if not corrected, will act to the serious detriment of the Association. It is the observance of the rule prohibiting the publication of papers belonging to the Association in Dental Journals until published in the annual transactions, which generally makes its appearance long after the meeting has taken place, and the subject matter and attendant discussions have been forgotten.

We hope to see the day when the Association will employ a competent short-hand reporter, and that immediately upon adjournment, any Dental Journal can, at a moderate expense, obtain a copy of *all* or *any part* of the proceedings to publish to their readers. The Association cannot afford to give the cold shoulder to the Dental Periodicals, for, as in all matters, political, social or religious, the press is the great lever; so in matters professional, it is the potent agent wielding its mighty influence for the general diffusion of all useful information.

G. T. B.

SURGICAL CLINIC.

We would announce to our friends that it is the design of Professor Mears to hold a surgical clinic on every Wednesday, from 10 to 12 o'clock, A. M., during the session of the Pennsylvania College of Dental Surgery. At this clinic, the diseases of the oral cavity and adjacent parts, will receive particular attention. We respectfully request our friends to assist in obtaining cases, and as all operations will be performed gratuitously, it is deserving of especial interest.

Dr. G. S. Beaty, of Toledo, Ohio, has donated to the museum of the Pennsylvania College of Dental Surgery a model of an upper set—a bad case of irregularity—where the four incisors presented an imbricated appearance. Attached to the model is the apparatus with which he corrected the irregularity. Although the apparatus is very simple and ingeniously constructed, and at once upon examination shows its effectiveness, we are unable to give an intelligible description without an engraving. As a suggestion to the comprehensive mind, we would say it consists of a band in front of the teeth, with slots in it opposite their approximal surfaces, and at these points are small screws, to which are attached ligatures, which pass around the teeth with a lap, so that by turning the screws force will be brought upon the teeth to separate them, at the same time rotating them upon their axis.

We tender our thanks to Dr. Beaty for his donation.

E. W.

Book Notices.

WE have received from the author, Dr. F. R. Thomas, of Phila., a neat and practical little work, entitled: "Manual of the Discovery, Manufacture and Administration of Nitrous Oxide, or Laughing Gas, in its relation to dental and minor surgical operations, and particularly for the painless extraction of teeth." This gentleman has had an extended experience with this agent, and has detailed in a clear manner his views upon the subject, and while we totally dissent with some of the positions assumed, yet, taken as a whole, the work gives evidence of careful study and revision. We are sorry to see the illustration on page 72—exhibiting the operator and assistant administering nitrous oxide to a patient from a *rubber bag*—a method which in our judgment is not only offensive to sight, but is opposed to cleanliness and enlightened practice. We sincerely hope the time is not far distant when the rubber bag will be laid aside, with the old fashioned key, as entirely obsolete. Our objections to the position assumed, that it is necessary to make fresh gas, and that *old* gas does not possess anæsthetic properties, will be seen elsewhere. The addition of a chapter on suggestions in regard to extraction, is replete with good and practical instructions. There is one point upon which the author does not seem to place proper stress, *i. e.*, the importance of making pure gas by a careful regulation of heat to the nitrate of ammonia, and the proper washing of gas, through solutions, to remove impurities. This subject has received the careful attention of many writers; prominent and foremost we cite the name of our old and worthy friend, Prof. Geo. Watt, whose cautions ought to be remembered and recognized by all. We quote from the work

the principal reference to the use of purifying solutions. "In purifying it, it is unnecessary to use anything but a solution of the sulphate of iron in one bottle, and fresh water in the other two. Some chemists recommend the use of caustic potash in addition, for the purpose of neutralizing any chlorine gas that may be present. In my judgment, however, the use of these chemicals is superfluous, as I have found by experience that the action of the gas is precisely the same, whether it is washed through fresh water and allowed to stand a sufficient length of time (about five or six hours) for the water in the gasometer to absorb any impurities that may have passed over with the gas." "In manufacturing nitrous oxide in an apparatus (Barrel) like this, no chemicals are needed, inasmuch as it receives sufficient purification in its passage through so large a quantity of water." "Now apply the heat gradually, avoid fracturing the retort, and closely observe the process. When the ammonia is melted it very soon commences to boil, after which regulate the heat to keep it quietly boiling until it is nearly all decomposed. Should it get to boiling too rapidly, take a dry cloth and raise the retort out of the sand-bath until the violent ebullition diminishes, when it can be replaced." Were this manual written for those who were experienced in making gas, and were aware of the chemical changes which would ensue from too great heat, poisonous gases being generated, &c., the above description, on the application of heat for the decomposition of the salt, would be sufficient; but the author informs us in his preface, that "The object in writing this little work, is to endeavor to supply a want long felt to exist in the literature of the subject. The necessity of a plain and practical manual on the manufacture and administration of nitrous oxide, has been apparent to all who have used this agent." And this manual is designed to supply this want, which is so "apparent," and hence, should not be defective in these essentials.

G. T. B.

THE MEDICAL TIMES, a semi-monthly Journal of Medical and Surgical Science, No. 1, Vol. I, published by J. B. Lippincott & Co., Philadelphia, has been received. From the prospectus which was issued the professional public were led to have "great expectations" of the new journal; and while, perhaps, the over-sanguine may be somewhat disappointed in its contents, it yet presents a creditable array of original communications, prominent among which are the Clinical Lectures by Profs. S. D. Gross and Alfred Stillé, and Clinical Reports and Reviews. The letter from Vienna is particularly interesting. We congratulate the new journal on its happy selection of name—so near our own—and present our wishes for its complete success.

G. T. B.

Selections.

ON THE INHALATION OF THE NITROUS OXIDE GAS WHEN THE LUNGS ARE DISEASED.

BY E. HOLDEN, M. D., OF NEWARK, N. J.

The cases which form the basis of the following article will probably commend themselves as of some interest to any physician called often to answer the question, "Can I inhale gas at the dentist's with impunity?" The observations from which the cases are selected have been numerous, and the cases themselves are, in a measure, typical of classes.

The availability of this gas for slight and brief surgical operations—its speedy action and the equally speedy disappearance of all effects of anæsthesia, are making its use so common that all information regarding it must prove of value, and especially so in view of the awakened interest in the subject of inhalation of gases as curative agents. I may be pardoned for parenthetically stating that, while my own experience with nitrous oxide as a therapeutic agent in phthisical cases has been anything but favorable, and I have seen hæmoptysis immediately follow a carefully conducted inhalation of oxygen, yet I by no means felt assured that their inhalation *per se* was especially injurious at the commencement of the present investigation. Nitrous oxide in its purest state produces rapid venosity of circulation; the great founder of the German medico-anatomical school, Rokitsansky, asserts that a condition of venosity is inimical to tubercle (p. 241, vol. ii): theoretically, therefore, the gas should be beneficial in tuberculosis. Oxygen produces, of course, the opposite condition.

Tuberculosis, according to not a few brilliant laborers of the present day, is but a commencing death of organism—an excessive retrograde metamorphosis of tissue-destruction without adequate repair, and which the oxygen of mountain air and of unrestrained out-door life is credited with power to arrest; theoretically, therefore, oxygen should be beneficial by inhalation. M. Demarquay has recently experimented in this direction, and paradoxical as the ideas in the cases as stated may be, they are easily reconcilable by the belief that *neither* of the gases as used has been, or is likely to be, curative. The general effect, however, of the agent under consideration, when persistently and frequently inhaled as a therapeutical means, has little to do with the answer to the question already quoted, and which can be more pertinently rendered, "Can I, having diseased lungs (and especially if subject to hæmoptysis,) inhale nitrous oxide gas at the dentist's with safety?"

Most of the cases from which the following have been selected have been observed at the dental rooms of Dr. J. B. Da Camara in this city, (Newark, N. J.,) whose extensive experience with the gas is probably second to none in this country. The gas was made in the ordinary way by heating nitrate of ammonia in a retort, maintaining a temperature of 400° to 500°, and thoroughly washing through successive jars of water. The ammonia was selected with especial care, in order to avoid accidental contamination with hydrochloric acid, the presence of which invariably results in an admixture of free chlorine with the peroxide, and consequently in an irritant effect upon the lungs. It is well to observe that frequently persons presented themselves who had at other places tried inhalation in vain, violent headaches, convulsions, suffocating sensations, &c., had inva-

riably necessitated abandonment of the effort; yet they succumbed with greatest ease when the pure gas was administered. This point is the more important, since none of the effects noted in the subjoined cases can be attributed to impurity of gas.

From the washing-jars the gas was conducted to large metallic retorts, holding from 400 to 500 gallons, and made fresh every day, since it is a singular fact that age seems to impair its anæsthetic power, and gives rise to symptoms never observed when the gas is used in freshness and purity. This impairment is far more marked when rubber bags are used as holders, and seems to admit of explanation in such cases; but in metallic receivers suspended in water already saturated with all the gas possible to be absorbed (three-fourths of its bulk,) without escape and without diminution of volume, reason for loss of anæsthetic power is not so apparent.

The inhalation was performed with total exclusion of atmospheric air through a mouthpiece of silver which fitted accurately about the cheeks and lips, expiration being performed through a valve in the same piece. The patient was always in the sitting posture, to facilitate easy and frequent auscultation and percussion.

The two following cases may be interesting as illustrative of the general effects of inhalation upon a healthy person.

CASE I.—A girl, æt. 12 years; ruddy complexion; about average size: lungs, heart, and indeed all organs, in sound condition; no nervousness or apprehension; pulse 65, after steady inhalation for one minute; pulse accelerated without increased number of respirations; rapid discoloration of lips, then of extremities; no distension of superficial veins; marked lividity of whole face; eyes remaining open (not a universal rule, but rather unusual,) disclosed slow dilatation of pupil; eyeballs visibly receding as after death, and the countenance corpse-like; anæsthesia complete before expiration of second minute, and preceded by slight struggling as if to prevent suffocation; pulse 80, soft and regular; inhalation discontinued; duration of anæsthesia fifteen seconds; time from instant of complete anæsthesia to complete and perfect recovery, between one and two minutes.

Lungs in this case not examined during anæsthesia; as a result, however, of many examinations of others, the following statement may be considered illustrative:—

The first change, and one that usually occurs after the third or fourth full inhalation, is a marked softening of bronchial air sounds, and intensification of the vesicular, followed by speedy intensification of the former and obliteration of the latter. Then follows the sub-crepitant rhonchus indicative of mucus in the finer bronchial tubes, then rapidly the sounds of air-bubbles in the larger tubes, prolonged respiration, and vocal resonance.

In several cases suffering from the commonly-styled “stuffed” feeling that often ushers in a subacute attack of bronchitis, and in which a marked sibilant character was observed in the passage of air through the finer bronchi prior to inhalation, a remarkable cessation of such sound was observed after a few inhalations, whether correctly or not, and was attributed to sudden relaxation of bronchial spasm. This peculiarity will be again referred to in connection with Supplementary Case II.

The second of the cases designated illustrative is more rare, because

anæsthesia is peculiarly rapid, and unaccompanied by lividity or other noticeable symptom.

CASE II.—Male, æt. 27, unmarried; temperament sanguine; complexion fair; health good, and believed sound in all respects, but mother died of consumption, and partly had suffered from (strumous) necrosis of femur, and might, perhaps, be said to be more than usually susceptible to influences of temperature.

Examination prior to inhalation revealed weakness of vesicular quality, want of proper breeziness and tone to general respiration, a condition suggestive also of imperfect resilient power of lungs, but no disease; pulse 72.

One inhalation produced incoherence of speech, and four anæsthesia. Examination during inhalation gave results similar to those stated as common to sound lungs, but no lividity of extremities or lips existed; vesicular quality of respiration absent during the whole period of anæsthesia, however, and gums and inside of cheeks of clearly venous hue; pulse 80 to 95, and variable. Anæsthesia prolonged two minutes; recovery complete in two minutes, and normal condition of lungs restored within that time.

The following notes also, taken at intervals during the five months occupied in the investigation, may be of interest:—

a. Nitrous oxide inhaled in the manner indicated produces no tendency to laughter, admixture with atmospheric air being essential to the development of this well-known characteristic.

b. There is usually considerable struggling at the approach of anæsthesia, occasionally suggestive of desire to escape suffocation, but which is probably owing to an automatic impulse occasioned by the thought of possibility of suffocation already existing in the mind of the patient, since the subject last in the mind becomes the foundation of any dream that may occur; for example, the bubbling of water produces in the semi-unconsciousness just preceding and following anæsthesia a dream of music; the steady tick of a clock, the roar of the surf on the beach whispers of pleasure or pain, the scenes or instruments that usually give rise to these emotions. It is probable, also, that in this way we may explain the evident erotic tendencies that are so frequently developed, the most chaste and virtuous being liable to gestures and movements which, if not so evidently automatic, would be considered most lascivious. (See supplementary case I.)

This tendency is, without doubt, the result of the thought of possible violation; for the subject of it is almost universally a female, and there are few who sit down in a dentist's chair who have not heard or read of the stories regarding such attempts upon females while in a state of unconsciousness, and almost always where this erotic excitement is developed there are none but males present, the patient partly reclines with feet somewhat elevated, and a fear, perhaps only momentary, that there is danger, would be a most natural one.

c. There is almost always intensification of the senses, especially of sight and hearing, just prior to unconsciousness, and in spite of the seeming contradiction in the statement this intensification may possibly continue in many cases throughout, (the faculties of memory and co-ordination being in abeyance,) for however oblivious upon recovery a person may be of having suffered pain, yet the contortions of countenance and occasional

screaming show that feeling is not destroyed ; of course it is not asserted that anæsthesia cannot be made so complete as to utterly destroy feeling, but usually this is not the case, although to all intents and purposes unconsciousness is perfect, and no memory of pain exists upon recovery. I am indebted to the dentist, at whose office many of these experiments were made, for a suggestion which is probably a correct one in reference to the anæsthesia produced, which is that there is simply a lightning-like flow of ideas with impairment and in many cases obliteration of memory, for a person *may stand erect* and gradually inhale sufficient gas to produce complete oblivion, and experience all the minute shades of thought and feeling that belong to every-day life, and this through an apparent series of days and weeks and even years, live, travel, be ill and recover, enjoy, suffer, and in fact undergo a distinct existence, and yet recover consciousness in time to prevent falling. If in this ecstasy a tooth be drawn, or other surgical operation be performed, the painful sensation is intruded upon with such lightning-like rapidity, and is so speedily merged into the tissue of the dream, as to be overwhelmed and forgotten.

d. Vision is, as I have said, frequently intensified, and perhaps invariably so long as a state of semi-consciousness is maintained ; the minute twigs on somewhat distant trees, the fine letters upon street signs, faces out of recognizing distance, &c., are brought within range often to an astonishing degree. Hearing is also intensified, although greater care is necessary to maintain only a certain amount of æsthesia, for the line is easily crossed, and dullness of hearing is the consequence.

e. There is occasional (not invariable) dilatation of pupil.

f. There always exists an increased tendency to bleed, whatever be the condition or temperament of the patient, and whatever be the part of the body cut or abraded. The case of the young girl cited first, as illustrative, was the subject of severe hemorrhage from the gums during the operation of extracting teeth, and at intervals, for three weeks following (on two occasions to syncope.)

g. Three patients, the subjects of epilepsy, hysteria, and epileptiform hysteria respectively, came under observation, in regard to which the following extracts are made from notes :—

The first, a girl of 19, who had been subject to convulsions since childhood, exhibited no tendency to convulsion during, or subsequent to, anæsthesia, although she had suffered from attacks as often as ten or twelve times a week for several weeks prior to inhalation.

The second, an octo-teen aged 21, had been the victim of as frequent attacks of epileptiform hysteria ; she had two convulsions in quick succession upon the approach of unconsciousness, and several immediately after (no dilatation of pupil, and no lividity).

The third, typical of a very large class of patients, exhibited violent hysteria immediately upon regaining, or rather approaching, consciousness, and for several hours suffered recurrence of attack.

h. While an antipathy that may be termed idiosyncratic may actually exist to the inhalation of the gas, inability to produce anæsthesia almost invariably arises from impurity of the anæsthetic, or from its staleness, and a large majority of all the headaches and subsequent bad feelings that are sometimes complained of, undoubtedly arise from the same cause. Case IV is, however, an exception to this rule.

CASE I.—Male, æt. 35, 5 feet 10 inches high, 140 pounds weight, florid complexion, healthy appearance, had occasionally raised blood last winter and ten years ago, at each of these periods, covering a space of six weeks; had also had two attacks of unconsciousness attributed to sunstroke; has often inhaled the gas.

Examination of lungs prior to inhalation showed disease of one apex probably tubercular, incipient, and quiescent. Five full inspirations produced marked lividity of lips and speedy anæsthesia, with twitchings of muscles, and symptoms of threatened convulsions. Examination during unconsciousness showed in vicinity of disease first, rapid extension of area of dullness, accompanied by increased resonance of bronchial air sounds, intensification of vocal resonance (the occasional moans of patient being transmitted with singular acuteness,) then fine crepitation in vicinity of disease gradually appearing also in healthy portions of both lungs and becoming a marked coarse rhonchus at apices with total disappearance of vesicular murmurs.

Upon withdrawal of the anæsthetic, recovery was remarkably rapid (30 seconds.)

Examination immediately after return to consciousness gave a generally intensified respiratory murmur with diminished vesicular quality, and rales more or less pronounced, bronchial murmur tubular, two points in one lung near the base an occasional twang as of a snapped guitar string, restoration of normal quality and condition too rapid to permit proper percussion (15 seconds,) restoration of natural color to lips and face equally rapid.

Examination twenty-four hours after inhalation showed normal condition restored in healthy portions, and no marked change at point of disease.

Patient states that having had occasion to inhale frequently both in this and a former winter, he had been subsequently troubled with raising of blood and irritative morning cough, which discontinued upon renouncing the practice.

CASE II.—Male, æt. 54; mastication of food impaired by loss of teeth, and therefore dyspeptic; has a cold, states that lungs were always weak; never raised blood, has the appearance of moderate health. Examination prior to inhalation: right lung sound, left gave pronounced bronchial breathing at apex; expiratory murmur jerking and wavy; vocal resonance behind scapula over a space of two square inches, no signs of softening or vomicæ; pulse 90.

Under inhalation, nervous struggling somewhat during second half minute; lips and nails livid; becoming partly unconscious, tore away the inhaler; after two minutes again inhaled; unconscious in one and a half minutes; recovery commenced almost immediately upon withdrawing gas; laughter and crying; volubility with connected and intelligible speech two to three minutes, during which examination was again made; pulse 100.

Examination during unconsciousness gave duplication of sounds stated under Case I.

Examination after discontinuing inhalation gave bronchial breathing well marked and inclined to tubular, over whole of upper portion of both lungs; vesicular character of inspiratory act replaced by sibilant murmur; crepitation in vicinity of solidified tissue; gradual return to normal character; party expresses a sense of great relief in breathing, and feels generally better than before inhalation.

CASE III.—Young lady, æt. 24, states that she has weak lungs; never raised blood: takes cold easily; is subject to pain in left shoulder; complexion good; appearance that of average health.

Examination before inhalation: right lung sound; left, under scapula, shows vocal resonance, pronounced bronchial breathing, prolonged expiratory murmur, and in short the evidences of consolidation of tissue without softening or local inflammatory action.

Under inhalation pulse ran down rapidly, becoming weaker, till almost imperceptible; much gas required; lividity not marked; nervous twitching and convulsive struggling considerable.

Examination after anæsthesia (two minutes) confined to spot above referred to: breathing amphoric; fine crepitation in vicinity of consolidation, (vesicular murmur elsewhere clear and distinct;) no increase or change in sensitiveness of part; sounds strongly suggestive of the accession of diseased action upon a latent phthisis, such as is usually ascribed by the patient to a new cold.

CASE IV.—Female, æt. 35; has had occasional attacks of dyspnœa upon exertion, referred by her physician to disease of heart; has tried before to inhale nitrous oxide without success.

Examination prior to inhalation showed signs of incipient phthisis in both lungs at apices; heart sounds suggestive of dilatation, (weak action and heightened systolic pitch;) apex beat, however, distinct; no undulatory impulse, no prolonged post-systolic silence.

Inhalation of more than a few breaths of gas impossible, although pulse remained unchanged, and no signs occurred of systemic obstruction; upon removing the tube patient gasped convulsively for about a minute.

Examination during inhalation gave simple respiratory murmurs, puerile in character, with no other change; heart sounds more forcible with less quickness, exaggerated but not sharpened, giving to the ear a sensation of fullness or roundness.

Inability to inspire seemed to arise from loss of control over respiratory muscles, the pulse not accelerated nor heart's action labored.

The same phenomena occurred at two previous inhalations.

CASE V.—Female, married, æt. 36, delicate in appearance, had taken gas before with no ill effect; knows one lung to be weak; no preliminary examination.

Examination during inhalation and while recovering consciousness: Right lung presented sounds common to well lung under anæsthesia, (*i. e.*, exaggeration of respiratory murmurs, the tubular character of bronchial air column predominant;) left lung gave all the sounds of cavity with progressive softening and singularly modified metallic tinkle; as patient was recovering consciousness she moaned, and vocal resonance was found well marked; great dullness on percussion, and apparent consolidation over large portions of upper lobe of left lung.

These sounds gradually changed, and in two minutes it was evident that no cavity existed, but that a small space of lung tissue was impervious to air, and had been, or was, the seat of disease.

For several minutes the evidence of vascular congestion of the vesicular capillaries was well marked, and for five minutes after commencing to recover fine crepitation in the vicinity of consolidation showed an increased secretion of mucus.

Lividity of lips and finger-nails not well marked, and pulse fluctuated, probably from involuntary struggling. This patient had at times been troubled with severe cough and expectoration; never raised blood, but was subject to paroxysms of coughing upon rising in the morning.

Immediately after recovery and examination inhaled again to anæsthesia; auscultation and percussion gave same result as stated.

CASE VI.—Female, æt. 40, plump, well nourished, ruddy complexion, healthy looking, married. To my surprise found prolonged expiratory murmur under left scapula, vocal resonance and dullness at posterior apex and above scapula. Patient said “that lung is weak, and sometimes have had pain in it.” Liable to colds and cough; never raised blood, but once had a long cough with free expectoration; under clavicle on left side found prolonged expiration and general puerility of character of respiratory murmur.

Patient inhaled quietly and rapidly; lost consciousness without struggling; lividity slight and anæsthesia brief, but at the instant of unconsciousness my ear, being under left scapula near its superior portion, heard distinct metallic tinkle; a snapping at short intervals as of a wet guitar string; and rhonchus speedily followed by moist crepitation and pectoriloquy.

Examination after recovery, (several times within five minutes:) Crepitation coarser, but still well marked; transmission of voice sounds probably from stagnating circulation through vesicular capillaries and occlusion of air cells, but suggestive of dilatation of bronchi and pressure of air vesicles toward the thoracic walls, slowly disappearing, however.

No bad effects experienced beyond an attack of hysterical crying.

CASE VII.—Lady, æt. 33, frail looking, with hectic flush on each cheek; has had short hard cough for several months on rising in the morning; occasional pain through the right shoulder and heavy feeling on the chest in front; had also hæmoptysis somewhat profuse one year ago, was then in apparent health; has since had uterine troubles; emaciation not marked; is better now than for months; had once tried to inhale nitrous oxide from a rubber bag, and under unfavorable circumstances, “was almost suffocated, not put to sleep;” has recently been examined by a physician of some prominence in town, and pronounced (party says) sound.

Examination before inhalation: Vocal resonance and dullness behind left scapula with prolonged expiratory murmur; the right lung, the supposed seat of former hemorrhage (since a burning sensation in that lung had resulted,) considerably diseased; unable to decide without more critical examination whether there was cavity, but suspected it from hoarseness of bronchial note and voice sounds; pulse rapid and quick, (95;) under careful administration of gas the pulse rapidly assumed an hemorrhagic feeling; patient gasped and paled to an alarming degree; ear at lung detected sounds detailed in previous cases in lower left lobe, the upper giving simply exaggerated voice and breath sounds; the right lung at point of chief disease (apex) gave coarse crepitation and rhonchus, then scarcely any respiratory sound whatever. This fact, in connection with pulse and aspect of patient, decided us to abstain from giving more gas. Anæsthesia incomplete. Patient upon recovery was exceedingly alarmed, faint and gasping, clutching at the right and left breast alternately, and

presenting all the impression of a person laboring under hæmoptysis. No blood however came, and in about five minutes patient recovered completely and the lungs assumed the condition noted in the preliminary examination; no headache or bad feeling resulted.

CASE VIII.—Male, æt. 37, has been a soldier, lost one leg and endured considerable hardship; raised blood about once a year for several years; has had for a long time a slight cough, and eight years ago was told by a consultation of physicians that one lung was almost gone and the other full of cavities, but since then has made up his mind to live, and has been steadily improving.

Found on preliminary examination that the lungs were in tolerable condition, one sound, the other diseased at the apex (left) with apparently a small cavity, but without the sounds of active disease.

During inhalation *no marked change occurred*, yet party was fully under the influence of the anæsthetic; face and lips livid; stertorous breathing as if from chloroform; eyes open, and a strong tendency to clonic spasm. (This stertor was noticed in none of the preceding cases.) Party upon rousing up was wild and incoherent for about a minute.

Critical examination during return to consciousness enabled me to detect no change beyond a very slight exaggeration of respiratory murmur, and this not confined to the point of former disease.

Examination after recovery showed still no change; party felt well and exhibited no effects whatever of his recent anæsthesia.

CASE IX.—Female, æt. 30, medium appearance as regards health; states that she has weak lungs, and knows one lung to be seriously diseased, or at least has been told so by physicians.

Never raised blood, but has long had a short cough and aching pains about the shoulder-blades; has no strength, &c. Upon examination prior to inhalation found on posterior portion of middle lobe of right lung a circumscribed spot of perceptible dullness with roughness of murmur and evident deficiency of resilient power in pulmonary tissue; some vocal resonance also and impairment of vesicular character. Examination during inhalation over point of morbid sound showed roughness and vocal resonance exaggerated, and heart sounds clearly transmitted; after a few minutes coarse crepitation and sounds like the stretching of rubber bands; much gasping, lividity, struggling, and stertor with complete loss of consciousness. (Had tried gas before in St. Louis, and dentist had been obliged to desist.)

Upon recovering was unconscious of having struggled, and in a few minutes felt perfectly well, with no headache or other ill feeling. After ten minutes the condition noted in preliminary examination was restored.

CASE X.—Female, married, æt. 36, delicate in appearance, and thinks both lungs diseased; has had cough over a year, and hectic fever within six months, but of short duration. Has been gaining flesh and strength under cod-liver oil and wine; able to be constantly about; never raised blood.

Examination before inhalation: Disease of one lung at apex and of considerable extent with small cavity; no circumscribing dullness or consolidation in vicinity of the cavity; no evidence in short of progressive deposit or new breaking up of tissue.

Inhalation gave sense of great relief and lightness in the chest.

Examination during inhalation: Rapid enlargement of area of dullness; coarse crepitant rales and speedy disappearance of vesicular murmur throughout diseased lung.

Sound lung affected in a peculiar manner; apex, which had before appeared healthy, presented all the evidences of incipient phthisis, the remaining portion of the lung being affected in the manner indicated as common to healthy lungs.

After return of consciousness the sound* lung speedily cleared itself of morbid sounds; the other much more slowly.

The above cases given in detail would be left without comment but for the fact that as they are copied almost verbatim from notes made at the time of observation, their important features are not made prominent. The observations of which the cases are designed to be illustrative indicate to my mind, although they by no means prove the following facts, and from them it is easy to deduce an answer to the question proposed to be answered at the beginning of this article.

1st. Inhalation of nitrous oxide is in *some degree* likely to prove injurious in cases of phthisis.

2d. That inasmuch as pulmonary congestion is almost a necessity to anæsthesia by this agent, and is concomitant with a well-marked tendency to increase of hemorrhage from any cut or abraded surface, its inhalation is somewhat hazardous in cases where hæmoptysis has occurred, or where there exists an hemorrhagic diathesis.†

3d. That the sense of relief frequently experienced by those having diseased lungs is alluring simply, and does not indicate benefit, and believing it to be due to an annulling of the hyperæsthesia of the bronchial nerves, the inference follows that the agent may prove curative, or at least palliative, in asthma and in affections accompanied by bronchial spasm.

Supplementary Case II. is referred to as an example of its effect.

The two cases following are appended as of interest.

SUPPLEMENTARY CASES.—I. Female, æt. 62, feeble, supposed to have heart disease, complexion pallid, pulse irregular, subject to "faint spells;" preliminary examination showed no evidence of disease of heart; irregularity of pulse, probably due to nervous excitement.

Respiratory murmurs markedly puerile.

Under anæsthesia pulse became regular, then gradually imperceptible; face livid and peculiarly corpse-like; puerile character of respiration gradually gave place to soft vesicular murmur and normal condition found in sound adult lungs; evident erotic excitement, with motions as of sexual intercourse just prior to and following complete anæsthesia.

II. Boy, æt. 12, with the contracted chest, distended superficial veins, and peculiar look of an asthmatic.

Preliminary examination showed quite extensive emphysema of right

* During the ensuing four weeks this case was repeatedly examined; several inhalations were indulged in for the pleasurable relief obtained, the demand growing more urgent and at shorter intervals; pulse, always somewhat accelerated, gradually maintained a persistent celerity that demanded a discontinuance of the practice. Contrary to advice, she continued (secretly) inhalations elsewhere under assurance of an empiric that she would thereby become permanently cured. After two weeks of rapid failing was found having hectic fever and exhibiting advancing disease in both lungs; pulse constantly above 100, and emaciation very rapid.

† I have been credibly informed of cases where hæmoptysis has occurred in the dentist's chair, and have known of others following the inhalation of the gas.

lung with bronchitis of both, of chronic character and eccentric hypertrophy of the heart (right ventricle dilated;) apex beat two and one-half inches from proper place toward median line; area of dullness hard to define, owing to contiguous dullness of lower left thorax, but estimated at three and one-fourth in transverse, and four and three-fourths in vertico-oblique diameter, or about the size of the heart of an adult; pulse irregular; wheezing and trachéal rattle particularly well marked; has frequently raised mucus streaked with blood; had attacks of asthma since the age of five years. Examination during inhalation, which was not pushed to anæsthesia, showed gradual freedom of respiration, and was accompanied by a sense of great relief. After two minutes the air penetrated freely without wheeze or rattle to every part of both lungs; a portion of left lung, where vocal resonance had been noticed before inhalation, assumed healthy sounds, and resonance disappeared.

Examination ten minutes after recovery showed still comparatively healthy sounds throughout the lungs.

The night following this exhibition of the gas the patient had *no attack* of dyspnœa; no wheeze or rattle, and felt great relief in breathing, the first time in several weeks; he was, moreover, able to lie down in bed, for the first time in an equally long period. The next day examination prior to inhalation showed greater area of true vesicular murmur, and certainly what appeared marked improvement in general respiratory condition.

Examination during inhalation showed a gradual clearing out as it were of air tubes with marked vesicular improvement, passing gradually into a condition similar to what has been described, viz, of evident congestion and occlusion of air cells; well pronounced bronchial breathing, and at apex of left lung clearly transmitted heart sounds. After inhalation, which had been continued twelve minutes, patient spoke of the same sense of relief even while there remained still considerable occlusion of air cells.

The transmission of heart sounds, which singularly had occurred at seat of greatest emphysema, gradually ceased. Pulse and heart's action assumed a steady regularity during inhalation, and became again irregular upon recovery.*

Daily inhalations of about fifteen minutes were indulged in, but in no instance to complete anæsthesia, and from the date of the third inhalation no attack recurred for a month, and patient, who meanwhile had been using no other medication, was instructed to return home, and upon the first suspicion of threatened dyspnœa to resort to nitrous oxide; accordingly, February 18, he presented himself, saying he had felt "wheezy and found his breath somewhat shortened."

Daily inhalations as before, but for four days only: removed every vestige of trouble, and an examination of the heart gave the following remarkable result: area of dullness diminished laterally one-half inch; longitudinally three-fourths of an inch; apex beat one and one-fourth inches from its normal place.

Several weeks of immunity from all unpleasant symptoms have elapsed at the date of writing, and while one case proves nothing, however corroborative it may seem of a preconceived theory, the suggestion afforded by the remarkable relief obtained may be of service to some sufferer similarly situated.—*American Journal of the Medical Sciences*, July, 1870.

* This feature, already before noted, occurred in many instances, and is suggestive of possible benefit to be derived also by sufferers from cardiac neurosis.

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The Fifteenth Annual Session, 1870-'71.

PRELIMINARY LECTURES AND INSTRUCTIONS.—The Dispensary and Laboratory of the College will be opened on the 1st of September, where ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability; and during October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical peculiarities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND MICROSCOPIC ANATOMY.

The lectures from this chair will include a consideration of the entire subject of human physiology and physiological chemistry, with such portions of comparative physiology as are essential to a comprehensive understanding of the subject; also, the doctrines of life and organization. They will be amply illustrated by a propiate chemical experiments and vivisections.

The minute structure of the organs involved in the organic and animal functions will be carefully described and illustrated by diagrams and the class microscope.

ANATOMY AND SURGERY.

The instruction in this department will embrace a systematic course of Lectures on Descriptive and Surgical Anatomy, fully illustrated by dissections on the *cadaver*, preparations, models, drawings, &c.

The minute anatomy of the various organs and tissues of the body will be shown by the class microscope, and particular attention will be given to the demonstration of the anatomy of the head and face.

Clinical instruction in the diagnosis and treatment of the surgical diseases of the mouth will be given once a week by the incumbent of the chair. Students will thus have the opportunity of studying oral diseases, and witnessing the operations adopted in their treatment.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the demonstrators.

IN THE OPERATIVE DEPARTMENT.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

IN THE MECHANICAL DEPARTMENT.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

PRACTICAL ANATOMY.—The great facilities for the study of practical anatomy to be found in Philadelphia, in several well ordered and supplied dissecting rooms, present to the student advantages for its prosecution superior to those offered in any other city.

HOSPITAL CLINICS.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

FEEES.

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For the Course, (Demonstrator's ticket included,) - - - - -	100 00
Diploma, - - - - -	30 00

TEXT BOOKS AND WORKS OF REFERENCE.

Gray's, Leidy's, Wilson's, or Sharpey & Quain's Anatomy; Carpenter's or Kirke's Physiology, (English editions,) ; Dalton's or Flint's Physiology; Tyson's Cell Doctrine; United States Dispensatory; Pereira's, Biddle's or Stille's Therapeutics; Fownes Elements of Chemistry; Brandt & Taylor's Chemistry; Lehmann's Physiological Chemistry; Flint's Practice of Medicine; Wood's Practice; Tomes' Dental Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Wildman's Instructions in Vulcanite Work; Barker on Nitrous Oxide; Gross' or Erichsen's System of Surgery; Paget's Surgical Pathology; Hartshorne's Conspectus of the Medical Sciences, or other standard works on the same subjects.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupilage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

For further information, address

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THE DENTAL TIMES.

VOL. VIII.

PHILADELPHIA, JANUARY, 1871.

No. 3.

Original.

DR. S. P. CUTLER'S REPLY TO DR. ZUR NEDDEN.

In the DENTAL TIMES, for October, 1869, I notice, on page 79, the editor quoting from the July number of the *Deutsche Vierteljahrsschrift für Zahnheilkunde*, gives a list of articles contained therein.

Under the head of synopsis of American Dental Journals, the editor says: "We observe Dr. Nedden, sharply, and *we think*, justly, criticises Dr. Cutler for his failure to give more than his mode of preparing a pulp for microscopic investigations, after he had promised to publish his mode of discovering the millions of nerve fibres." Not knowing what my criticiser over the water has said, any farther than the notice by the TIMES' editor, of Dr. Nedden's criticisms, stating the fact of my failure, &c., I infer from what was stated, that the Dr. referred to one of my articles only; if so, I will call his attention to various articles in the different journals for the last several years on this side of the Atlantic. I am not aware that I promised to prove my statements in relation to a large molar tooth containing millions of nerve fibres, any farther than giving the result of my researches and the formula for calculating the probable numbers which any one versed in simple arithmetic, if a microscopist, can do, if the fact be admitted that teeth do have nerves at all. If that fact be denied, it is of no use for me to make any defence in the premises. I stated in one article on the subject this: Prepare a specimen from dentine at the point where it joins the enamel, so as to show the dentinal tubular openings after their coronal or peripheral bifurcations of a given size, say a half a line or less, and count the number of tubular openings in the specimen, and then simply see how many will be contained in a square inch, which, according to my imperfect calculations, will be about

nine millions or more, that is, allowing a tubuli for every five thousandths of an inch. I also stated the fact, that very large teeth contain from one-half to two inches of superficial surface after the removal of enamel and cement. The only chance for any error in my calculation rests in the distances apart of the tubuli at the precise surface of the dentine. In the calculation and statement I still maintain, without any apprehension of contradiction, as it rests on a simple arithmetical calculation only, without any hypothesis about it.

Who ever attempts this experiment may make many attempts before he succeeds in getting a satisfactory specimen; unless the specimen is taken just at the contact with the enamel, nothing like as many openings will be found to the square line. I lay my statements at the point of greatest numbers of tubuli, maintaining that each contains a nerve filament in a live tooth. If my foreign critic denies or ignores the existence of nerves in the tubuli, and adopts the hydrated theory of Koliker and others, I have no arguments to offer him on the subject, only to ask him if he believes in the sensibility of water, or the power of water to convey sentient or sensorial impressions through the dentinal structures. I am well aware that the statement I made in relation to a tooth containing millions of nerves was met by the profession with no small amount of incredulity. This I expected and anticipated before making the statement. Just under the enamel, in contact with it, the tubuli are nearly double as numerous as they are just a little farther in, as such and every tubuli forks or bifurcates one or more times just before entering the inter-enamel membrane. So far as the crown of the tooth is concerned, I have never seen an exception to this bifurcatory system in the fangs. There may be possibly some exceptions, though I am not certain of the fact.

I have before stated, in former papers on the subject, that all tubes passing from the crowns, with all their branches, invariably terminate at the enamel, none falling short or terminating in the inter-tubular regions; not always so, however, with the tubuli arising in the fangs.

Now, in order to determine whether or not my statements be correct in relation to millions of nerve fibrils in the dentine of a tooth, let any competent microscopist prepare specimens of dentine as above directed, and when a suitable one is found, with the tubular openings passing through the specimen, then apply the micrometer and measure the distances between the tubular openings, and if they are found to be one five-thousandth of an inch apart and the surface of the dentine of a tooth, with one superficial inch, will clearly prove my former statements, which have been so severely criticised by my friend over the water.

Should the tubuli be found to be a greater distance apart, my calculation will fall short in proportion to the increased distance. In case the distance should be found to be double, my calculation will fall short a little over two-thirds, which would give only about *three millions* (3,000,000) for a molar, with only one superficial inch; though some large molars, about double that, which would give me about six millions instead of eighteen millions. Let my critical friend follow out my directions, and he will find my former statements nearly correct, not taking into calculation the very minute feathery branchings in the fangs of many teeth, which themselves might be numbered by hundreds of thousands, which still further sustains me in my former statements.

My present method of preparing soft pulps, so as to demonstrate the fact long ago stated by myself, that the nerve fibrils were traceable through the pulp membrane into the dentinal tubuli, is as follows:—

“Extract a cuspid, bicuspid or incisor with a living pulp, then put the tooth into alcohol and let it remain for twenty-four hours or more, then put the tooth into a solution of chromic acid, sufficiently strong to give it a deep color, and let it remain for several days, then remove the tooth and file or rasp it down near the pulp cavity on one side, or on all sides if desirable, then crush the tooth in a vice or forceps just enough to be able to separate the broken parts, and remove the nerve pulp and press it between two thick pieces of glass, so as to flatten it sufficient to render it transparent, then mount in balsam pitch as usual and it is ready for use. Another method of mounting is, to slice it into thin sections with a razor, and mount as above directed. Prepared in this manner, the nerve fibrils are seen with the greatest beauty and clearness; the fibres withdrawn from the dentine in the region where the tooth had been dressed down, may be distinctly seen projecting through the pulp membrane, laying flat on the membrane as a general thing. Where the pulp is pressed and flattened down between glasses, these fibrils may be chiefly withdrawn through the membrane, leaving the fibrillar openings clear and distinct; where they are thinly sliced the fibrils will all be seen *in situ*.

Pulps prepared in this way remain full, plump and firm, as all the elements are hardened and fixed, no evaporation and shrinkage, and in addition bringing out the nerval structure with the greatest facility. This is somewhat different from that recommended by Frans Bouel.

This experiment clearly demonstrates the fact that the nerve fibrils are projected from the soft pulp into the tubuli, which has been a mooted question so long, and shows the continuation of the pulp fibrils without any break into the tubuli.

TO REDUCE GOLD AND SILVER SCRAPS AND FILINGS TO PLATE.

BY T. L. BUCKINGHAM, D. D. S.

Now, when rubber work has nearly run its course, as I hope it has, and patients are beginning to demand better materials, it may not be out of the way to say a few words in regard to reducing gold and silver scraps and filings to plate, so that they can be worked up. This information is required more by the younger members of our profession than by those older, as many of them have come into the profession since rubber-work was introduced, and have seen little or no metal work done; in fact, we have occasionally students who have been in practice four or five years, and have never done a piece of metal work. Hence we have adopted a rule at our college requiring each student to make a piece of metal work before he can graduate. I think the profession at large will agree with me in saying, that continuous gum, gold, or even silver work, is much better than this cheap rubber work, that is so generally used. It does one good to see, as we do occasionally, a piece of gold work that has been worn ten or fifteen years, and looks nearly as well as it did when made. There is about the same comparison between it and this cheap rubber work that there is between a good gold and an amalgam filling.

As we cannot afford to throw away the gold and silver scraps and filings as we do those of rubber, it is well to know some process to reduce them to plate. The process I have adopted, and, if tried by others, I think will be found very good, I will not say the best, for the same results may be arrived at by other processes, is to first keep the scraps and filings as clean as possible, for, with the greatest care, a large amount of foreign matter will get in. We have constantly to use zinc and lead for our casts, tin sometimes for patterns, and the wearing of the files adds iron or steel; these, with the plaster and other foreign substances that will get in, make quite a conglomerate mass. The first thing I do with my gold scraps and filings is to pick out all the large pieces of gold with a pair of pliers, removing all the large pieces of the other baser metal. Then sieve the small scraps and filings through a sieve, which I have made out of a tin blacking-box lid by punching it full of holes with a plate punch as far in as I could reach, and then making holes in the centre with a small punch and hammer. It may be possible to buy small sieves, but I have not seen them for sale at any of the depots. This separates the filings and very small pieces from the scraps. The scraps are now spread out on a piece of clean paper, and all the pieces of base metals are picked out with a pair of pliers. Through the filings is first passed a magnet, which removes all the iron and steel; they are then put into an evaporating dish or Florence flask, and some dilute nitric acid poured on them. This dissolves the silver and baser metals, except the tin, which is oxidized,

and remains with the gold filings. When the acid ceases acting it is poured off and kept, to obtain the silver which it contains. The filings should be washed several times with fresh water and then dried, when they are ready for melting. The larger pieces of scraps and parts of old plates that contain no solder, and are firm enough to make plates out of again, should be melted together with a little borax in a clean crucible. The filings and scraps that contain solder and stays, with platina pins in them, should be melted together, and when in a melted state a few pieces of saltpetre (nitrate of potassa) should be thrown into the crucible. Nitrate of potassa is decomposed, the oxygen oxidizes the baser metals that are present, and they are absorbed by the crucible or float on the surface with melted borax. The most of the oxide of tin, if any is present, melts, and is absorbed by the crucible, but it is exceedingly difficult to get rid of all the tin in this way; it is one of the hardest metals to separate from gold that we have, and there will be nearly always a small portion remaining, but as it adds to the elasticity and hardness of the gold the small quantity that is left does little harm. We cannot be certain of the quality of gold refined in this way—it may be more or less than eighteen karat fine; the platina and tin changes the color very much, and also gives it hardness and elasticity, so that this gold should only be used for making clasps and stays for the teeth; for which purpose it answers better than the gold plates alloyed from the coin.

To reduce silver scraps and filings, we proceed in the same manner that we do with gold, separating the larger pieces that will do to melt without being refined and melting them with a little borax, or if they contain solder, and it is necessary to refine them, throwing into the crucible a little saltpetre until they are melted. By using a sufficient quantity of saltpetre, they may be made nearly pure silver. The scraps which contain solder and the filings, after being sieved and having a magnet passed through them to remove the iron, should be put into an evaporating dish or Florence flask, and have dilute nitric acid poured on them; this, with a gentle heat, will dissolve the silver. The acid should be added until it ceases acting, which may be known by no more red fumes coming over when fresh acid is added. This operation should be performed in a chimney place, or where there is a draft of air to carry the fumes out of the laboratory, as they are poisonous to inhale, and oxidize the instruments when they come in contact with them. The residue that is left in the flask, after the acid containing the silver is poured off, usually has enough of gold filings mixed with it to pay for the trouble of refining the silver. It is singular with what tenacity gold will stick to nearly everything it comes in contact with, except a man's pocket book, and there it almost appears to undergo a spontaneous evaporation.

The next part of the process is to obtain the silver from the solution. This may be done in several ways. If a piece of copper plate be suspended in the fluid that contains the silver, the nitric acid will leave the silver and combine with the copper. The silver will fall down in a dark, grayish, crystalline mass, and only requires to be dried and melted with a little borax, or the solution may be diluted with twice its bulk of water or more, and a solution of common salt (chloride of sodium) poured into it, taking care not to pour too much in at one time. A white curdy precipitate forms, which soon falls to the bottom of the vessel. When no more of this precipitate is formed when fresh additions of the solution salt is added, it may be allowed to settle, and the fluid poured off and thrown away, as it contains nothing worth saving. The chloride of silver should now be washed by pouring over it some fresh water, and stirring it up; when it has settled, pour the water off; by repeating this operation several times, the chloride may be washed perfectly clean.

The next part of the operation is to reduce the chloride of silver. The chloride should be covered with fresh water, and add a small portion of sulphuric acid; then put a few small pieces of zinc in the vessel, and let it stand for a day. The chlorine will leave the silver and combine with the zinc. When all the chloride has been reduced, it is better to use an excess of zinc and sulphuric acid, to ascertain that the chloride is all reduced. The zinc, if any remains, should be removed, and fresh sulphuric acid added, so as to dissolve any zinc that might remain. As much of the fluid is now to be poured off as can be, without losing the silver, fresh water poured on, and this is to be repeated until the water comes off tasteless. The silver will be in a dark grayish powder, much finer than when it is precipitated with copper, and only requires to be melted and rolled to be brought into plates. There are other processes of reducing the chloride of silver, but the above are the simplest and least expensive.

Pure silver is always useful in the laboratory. We use it for making solder; two parts silver and one of fine brass makes the best silver solder. The silver should be melted first, with a little borax, and, while melted, the brass dropped in. If they are both melted together a portion of the brass will be burnt out, and the solder will not be so good.

Gold alloyed to the required karat with silver solder makes the best gold solder. Pure silver is too soft to make plates, but it can be used for rimming above the teeth, as it can be bent more easily than coin. Silver alloyed with platina makes a stiff plate, and is preferable to coin as it contains no copper.

Silver wire dipped in nitric acid forms nitrate of silver on the surface of the wire, and the caustic may be applied in this way to the gums, or to the pulp of a tooth, or into an alveolar abscess, more easily than it can from a solid stick of caustic.

ODDS AND ENDS.

NO. II.

BY E. WILDMAN, M. D., D. D. S.

In continuing this medley, I shall first give some formulæ for making spirit varnishes, as most of the formulæ given in the books for making these are quite complicated, and for our purpose not so good as the following simple ones, which are readily compounded :

SPIRIT VARNISHES.

No. 1.—*Sandarach Varnish.*

Gum Sandarach, 5 oz., (avoir.)

Alcohol (above 60 pr. ct.) 1 pint.

Place these in a bottle and cork tightly to prevent the evaporation of the alcohol; shake up the contents frequently, in the course of two or three days, at the ordinary temperature of the room, the gum will be completely dissolved, when the varnish will be made and ready for use. The solution of the gum may be hastened by placing the bottle containing the mixture in warm water, or near the fire, but it is not advisable to do so, as the heat causes the alcohol to volatilize, and should this vapor when mixed with atmospheric air come in contact with flame, an explosion would be the result. In case heat is used, place the bottle in a vessel of warm water, keeping it distant from any flame. In making this varnish, or according to either of the formula given below, strong alcohol should be used; I prefer the 95 per cent. If the gum sandarach is carefully picked, so as to free that used from all foreign matter and discolored pieces, before mixing with the alcohol, this formula will give a beautiful, colorless, transparent varnish.

Spirit varnishes should be tightly corked when set away, to prevent their becoming thick by the loss of the alcohol by evaporation. Should they at any time become too thick for use, this is easily remedied by the addition of some alcohol.

No. 2.—*Shellac Varnish.*

Gum Shellac, 5 oz., (avoir.)

Alcohol (above 60 pr. ct.) 1 pint.

In compounding this proceed as directed for making No. 1. This gives a brown varnish harder than No. 1, but not so slightly for coating models.

I give the preference to No. 1, or Sandarach varnish, for varnishing models, for the reason it does not discolor the plaster, it dries quicker, is more penetrating, and is sufficiently hard for all practical purposes. In using No. 1, where it is desirable to have it still more penetrating, dilute it with alcohol and apply several coats; it will then penetrate deeper into the plaster, and consequently, when dry, give a surface better able to resist any pressure or impact that may be brought to bear upon it. The object

in varnishing a model is to prevent the plaster from soiling the hands in handling it, to give a harder surface and to fill up the interstices between the particles of the plaster on its surface, so as to prevent the sand in moulding from adhering to it. The model should be dry, so as to allow the varnish to penetrate into the plaster, as, without this precaution, the gum is precipitated and forms a scale upon the surface by the union of the water and alcohol, which is not what is desired to be accomplished, neither should the varnish be so thick that it will not penetrate, nor so many coats of it applied when thin as to rise above the surface of the plaster and give it a polish like a piece of furniture.

No 3.—*White Shellac Varnish.*

Bleached Shellac, 5 oz., (avoir.)

Alcohol, 1 pint.

This treated as before directed gives a nearly colorless varnish. The bleached shellac is not so soluble in alcohol as the brown, nor does it produce so homogeneous a solution. Some writer states, by first digesting the bleached shellac in ether, prior to its mixture with alcohol, a perfect solution is obtained.

No. 4.—*Brown Spirit Varnish.*

Gum Sandarach, 3 oz., (avoir.)

Gum Shellac, 2 oz., (avoir.)

Alcohol, 1 pint.

Mix as directed for making No. 1. This gives a light brown varnish, with properties intermediate between the Sandarach, No. 1, and Shellac, No. 2.

Colored Varnishes.—When it is desirable to have a colored spirit varnish, it can be readily made by using either of the above formula as a base, and incorporating with it a sufficient quantity of the proper coloring matter to produce the required shade. When a dark shade is wanted, I prefer No. 2, or shellac varnish, as a base, but where a very light shade or a white is desired, a colorless base must be used. The coloring matter must be levigated very fine before it is introduced, and the varnish should be perfectly clear, or free from all foreign matter, to produce a good result. For making these different colors, the following may be used with good effect: For red, vermilion; for green, chrome green; yellow, chrome yellow, or for transparent yellow, gamboge; white, white oxide of zinc; for black, lamp-black, or better, a fine quality of ivory black; for blue, Prussian blue, &c.

No. 5.—*Crystal, or Balsam Varnish.*

For maps, drawings, and to give water-colored prints the resemblance of paintings in oil.

Canada balsam, 1 oz.

Spirits of turpentine, 2 oz.

Mix together. Before applying this varnish to a drawing or colored print, the paper should be placed on a stretcher and sized with a thin solution of isinglass in water and dried. Apply with a soft camel's hair brush.

This varnish is useful in preparing microscopic objects prior to mounting them in Canada balsam.

Carmine Ink.—A good red ink that is durable is often desirable, and cannot always be procured at the shops, either of the following formula can be relied upon. The first is extracted from the *Chemical News*, the second a modification of it.

No. 1.—Pure Carmine, 20 grs.
Aq. Ammonia, 3 f. oz.
Pulv. Gum Arabic, 18 grs.

Pulverize the carmine in a mortar, then add the aq. ammonia and stir until it is all dissolved, then add the gum arabic; when this is dissolved, the ink is ready for use; keep in a closely stopped bottle. Should it at any time become thick add a few drops of aq. ammonia.

No. 2.—Pure Carmine, 24 grs.
Aq. Ammonia, 2 f. oz.
Water, 2 f. oz.
Pulv. Gum Arabic, 24 grs.

Dissolve the gum arabic in the water, dissolve the carmine in aq. ammonia as above directed, then mix the two solutions together and the ink is made. To produce a good article the carmine must be pure and of the best quality. When very strong aq. ammonia is used, I prefer mixing according to formula No. 2.

Gummed Wheels are often a great annoyance to the operator in the laboratory. This may arise from either there being too much gum in proportion to the corundum in the composition of wheel, not keeping it sufficiently wet during grinding, or by oil or wax getting on the cutting face.

To restore the wheel to its former condition, immerse it in a very strong solution of caustic potash or soda, and allow it to remain five or ten minutes, then remove it with a pair of tweezers, wash well in water, at the same time brush the surface with a stiff brush. This treatment, if properly applied, will restore the wheel to its normal condition.

Concentrated Lye.—In the laboratory I find *concentrated lye* frequently useful where a strong alkaline solution is required. The manner in which I prepare it is, to take a box of *concentrated lye*, as sold by druggists and grocers, and dissolve it in about two quarts of water; allow the solution to stand until clear, then bottle and keep for use. If kept well corked, so as to prevent the admission of the air, it will keep unimpaired for any length of time. In using or handling be careful not to allow it to get upon the hands, as it is very caustic.

This solution is of the proper strength with which to treat gummed wheels.

DENTAL SUGGESTIONS.

BY J. D. WINGATE, D. D. S.

Plaster of Paris absorbs moisture very readily, and must be kept in a very dry place, and well secured from the air.

When in barrels a year, and even well covered, it will acquire an objectionable rottenness, but will set more quickly than new plaster; on that account it becomes better for taking impressions. In using plaster that is impaired, the blocks of teeth, no matter how well ground on, will open, and show unsightly joints. Even the casts may give, so as to cause a bad fit.

The spreading of the teeth may often be remedied, by bending to fit pretty close around the teeth a strip of tin plate three inches long and half an inch wide. After the cast is imbedded in the lower part of the flask, the tin can be set close up to the teeth, before pouring, to imbed them.

Lately I made a number of experiments on the expansion, density and tenacity of plaster, expecting to develop some new ideas. Excepting the dispelling of the bug-bear, expansion, the experiments did not develop much that is of practical advantage.

I had three pieces of tin plate, six inches long by one-and-a-half inch wide, bent up at the sides, forming a trough, closed at the ends with pieces of glass propped against them. In these, bars of plaster could be run half-an-inch square and six inches long. The sides of the moulds being smooth and parallel, the expansion would soon show distinctly; but very little was visible. These experiments are simple and easy. A number of bars were run. Plaster mixed to the thickness of cream was not as strong, nor as dense, as the thicker mixtures. It seems that the less water used in making the batter the denser the cast. Sulphate of potassa and salt each contribute to hasten setting, but weaken the cast. A bar one inch square will, if run as thick as possible, sustain a weight of two hundred and fifty pounds, if suspended in a careful manner.

CATCHES IN BLOCKS OF TEETH WHEN THE RIVETS ARE GONE.

It sometimes happens that the rivets of artificial teeth are defective, or have to be ground out, so as to set the crowns low enough. A wheel made of sheet copper, say daguerreotype plate, mounted on a lathe, covered with fine emory powder and oil, will cut porcelain or glass. With this, attachments as strong as rivets may be made for vulcanizing. For convenience, I use a small tin box, in which I keep the wheel. In the lid is a slit large enough for the wheel to revolve in. A box without lid, and shallow, is soldered inside of the lid in which the oil and emery is

kept, and revolving the wheel in the latter box through the slit will cover it with the emery and oil preparatory to using. Metal plates are coming in use again.

It is important to have good solder. The best gold solder I ever used is made of eleven parts gold plate and one part zinc. Melt the gold and add the zinc; remelting the ingot makes it tougher. This, when rolled into plate, has almost the purity of the regular plate, and is soft and pliable. In soldering it flows beautifully. The proportion may vary—fifteen parts gold to one of zinc makes a good rivet solder. The zinc gold solders had the reputation of “eating” into the plate while flowing. This can only take place when too much zinc is used. Then the solder flows before the plate is heated sufficiently to incorporate the surface with the solder.

BELLEFONTE, PA,

ON THE USE OF HYPO-SULPHITE OF SODA.

BY DR. JAMES LEWIS.

I noticed in the *TIMES* a correspondent had trouble with a dead tooth that had remained plugged for years in the mouth of a patient, without any unpleasant symptoms until the pulp cavity had been exposed to the air. The same cause produced disturbance in this case, as has lately been found to be the leading cause of serious disturbance on exposing visceral cavities to the air—viz: the propagation of *vitiriones* (microscopic organic bodies) from germs that are ever present in the atmosphere. Such difficulties are sometimes serious and involve great suffering, and not unfrequently loss of life, where visceral cavities are thus affected. Teeth thus affected, if taken seasonably, before disease has been propagated to the investing membranes of the tooth and the surrounding osseous tissues, yield readily to carbolic acid. Hypo-sulphite of soda, it seems to me, might be used with advantage in some cases where the disease has made some progress. The most serious objection to the hypo-sulphite of soda is its intensely bitter taste. I venture to suggest this remedy to the profession, for reasons based upon its theoretical value in the prophylactic treatment of certain diseases that are supposed to originate from lacteria and other infusorial forms of life. I would recommend ten grains hypo-sulphite soda in one ounce of water, to be used as an injection, to wash out the pulp cavity once or twice daily while under treatment, keeping the pulp cavity plugged in the intervals with cotton saturated with either carbolic acid or creosote, covering with wax. This treatment will not necessarily interfere with any topical treatment it may be necessary to apply to bring about a rapid resolution of the disease.

MOHAWK, N. Y.

We have, at the suggestion of Dr. Lewis, used this preparation, and have met with unprecedented success from its application. One case was of special interest, and we detail it. Mr. A. had a dead pulp in right superior central, opened into the cavity from lingual surface. Cleaned out the decomposing matter, washed with mild solution of carbolic acid. He returned in a day or two with periosteal inflammation, which was successfully treated, and the tooth and pulp cavity temporarily filled with cotton. The gentleman was suddenly called to Europe, and he was instructed to keep the pulp cavity filled with cotton, and on no account to leave the tooth cavity open, which instruction was disregarded. The tooth was left open six months, and he again came into my hands. The tooth was in such a condition that in *five minutes* after the external cavity was closed the tooth would ache violently. All treatment failed with it, when Dr. Lewis's article came to hand, was used as directed, and from the second application had no difficulty whatever. I look upon this article as a most valuable contribution to dental materia medica.

G. T. B.

DODGES.

BY J. L.

Almost every dentist will, in the course of time, find some little expedients which serve either to abridge, simplify or insure results. A few of such have occurred to the writer, and are now about to be presented to the profession.

In the investment of teeth, either for rubber or cheoplastic base, it is desirable to have the wax entirely removed from the surfaces of the teeth, and from around and among the pins. Suppose a set of teeth set up with wax in the usual way, and just ready to go into the flask. Detach one of the front sections, remove all adhering wax as far as practicable, then drop the section in a dish of boiling soda solution. This saponifies and dissolves any traces of wax that are left. To insure perfect cleansing, take out the section from the soda, scrub it a little with a tooth brush, then wet it again in the soda, having it moist; replace it on the model with fresh wax. Repeat this process with each section of the set. The model and teeth are now ready to go into the flask. On separating the flask, the wax will pull off from the teeth and pins readily, and any bits of wax tangled in the pins can be readily picked out with a fine excavator, no wax adhering to teeth or pins.

To provide for the escape of surplus rubber. The usual mode is to cut V-shaped channels radiating from the mould. The ridges between these channels generally afford a point of resistance for a thin film of rubber that prevents perfect closure of the flask. Instead of V-shaped channels,

cut away the plaster *against the flask* an eighth of an inch deep *all around the mould*; carry the cutting back from the flask to the margin of the mould, at which point it should not exceed, say one-thirtieth of an inch. Perhaps half that would answer. There is now a free channel of the thickness of the film of rubber mentioned above, all around the mould, and the flask will close perfectly, and every part of the mould will be filled if there is the least surplus rubber.

To facilitate the pouring of metal in cheoplastic work, make a slightly tapering funnel of paper, and insert that in the pouring orifice of the flask. It will increase the "head" of the flowing metal and insure its penetration into minute crevices. Pour rapidly.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

[Reported by THOMAS LINN.]

A Surgical Clinic, held each Wednesday, at 10½ o'clock, A. M., has been inaugurated in this Institution, under the direction of J. Ewing Mears, M. D., recently elected to the chair of Anatomy and Surgery.

As stated in the Annual Announcement of the College, it is the intention of the Faculty to make this a prominent and instructive feature in the course, and, it is hoped, that the graduates and friends of the college, residing in the city, or elsewhere, will direct to the clinic such surgical cases as may come under their observation. The services of Prof. Mears are rendered *gratuitously*, and patients of the clinic, upon whom operations are performed, will receive careful after-treatment at their homes.

Surgical diseases of the oral cavity, injuries and diseases of the jaws, including those of the antrum, will receive treatment by operation, or otherwise.

November 9th, 1870.

In opening the clinic, Prof. Mears stated that he would deliver a course of lectures on the injuries and diseases of the jaws, illustrating them by such cases as might be presented, or by such morbid specimens as could be obtained. With this instruction, the class would be enabled to study more satisfactorily the cases, and appreciate more fully the treatment adopted. He spoke at some length of the method to be employed in the examination of patients, in order to arrive at a correct diagnosis; the personal and family history should be carefully and minutely inquired into; these have an important bearing in determining the nature of the

diseases. Under the personal history, ascertain interrogations relating to the name, age, nativity, occupation, habits, social condition, and past and present condition of the patient. It is well-known that certain forms of disease are hereditary in their nature, and hence an investigation into the family history is essential.

In the study of cases, it is important to ascertain the cause. This is frequently difficult to obtain, but questions should be directed to the point, with a view to obtain as much information as possible.

The symptoms manifested during the progress of the disease are to be carefully studied, and finally, the character of the treatment proper to be adopted claims most careful consideration. He urged the class to cultivate a habit of careful inquiry in the examination of cases, in order to avoid error in diagnosis.

Through the kindness of his friend, the distinguished surgeon, Dr. Washington L. Atlee, Prof. Mears had the opportunity of presenting to the class, for their examination, a tumour of the left superior maxilla, removed by that gentleman from a patient in the month of June.

"The patient, aged 53, native of England, by occupation a cattle-drover, has always led an active out-door life, and enjoyed the best health. Two months and a half since, on his return from a visit to the far west, during which he was exposed to many hardships, he experienced pain in the left temporal region, extending down to the upper jaw, and felt most distinctly over the *site of the antrum*. The pain was severe and lancinating, and was thought to be due to neuralgia. Subsequently, the three molar teeth were extracted, under the belief that the pain was due to some disease of the nerves connected with these teeth. Soon after the extraction of the teeth, he felt a tumour projecting into his mouth; this tumour increased in size very rapidly, encroaching upon the cavity of the orbit of the eye to such an extent as to produce very marked exophthalmia. The rapidity of growth of the tumour clearly indicates its malignant character. It possesses the gross appearances of infiltrated medullary carcinoma, or encephaloid cancer. A microscopic examination confirmed this opinion, sections of the tissue presenting very numerous cells of rounded shape, varying greatly in size, and containing one, two, and even four comparatively large nuclei. The cell contents were markedly granular, and, in some instances, mixed with fatty granules."

In commenting upon this specimen, Prof. Mears spoke of the varieties of tumours which invade the superior maxilla. In general terms, tumours, no matter where located, are divided into two classes—benign and malignant.

Benign tumours are characterized by slow growth, absence of pain, firmness of texture, non-interference with surrounding tissues, and, as a

rule, they exhibit no tendency to ulceration. They are termed homologous growths, by reason of the fact that they are but abnormal developments of the normal structures of a part.

Under this head may be enumerated adipose, fibrous, fibro-cellular, recurrent fibroid, vascular, myeloid, cartilaginous and osseous tumours. Malignant tumours are marked by rapidity of growth, and are accompanied by great pain of a lancinating character; they possess a disposition to ulcerate or fungate, and invade surrounding structures, converting the normal into abnormal tissue with great rapidity. Belonging to this class are the varieties of scirrhus, encephaloid or medullary, epithelioma, colloid and melanosis.

Referring to the specimen, he said that it presented all the features of a malignant tumour, in rapidity of growth, severe, lancinating pain, and ulceration. He called attention to the point, that the pain was felt most distinctly over the region of the antrum, which was, in truth, the seat of the disease. Commencing in the lining membrane of the antrum, it had attacked, in succession, the adjacent parts, destroying them as it advanced, and converting the whole into a morbid mass. Of the entire bone, there was left but a small part of the alveolar process anteriorly. The orbital plate was softened and undergoing disintegration. He alluded to the fact, that in non-malignant tumours, absorption of the walls of the antrum occurs; but it is due, in these instances, to the pressure exerted by the growing mass. In malignant tumours pressure may exert some influence in the destructive process, but it is largely due to the disintegrating power of the growth itself. The name of "*fungus hæmatodes*" has been applied to these tumours when in a state of ulceration. The application of this term had given rise to much confusion in the minds of students, and should be abandoned. It is not the name of a distinct variety, but merely expresses a condition of ulceration, accompanied by hemorrhage, occurring in the well-known form of medullary or encephaloid carcinoma. The forms of benign tumours, which invade the superior maxilla, are the fibrous, fibro-cellular, recurrent fibroid, vascular, myeloid, cartilaginous and osseous. Among them, the osseous tumour occurs least frequently. The distinctive features of each of these varieties were discussed.

Mr. Heath, of London, in his Essay, (Jacksonian Prize of 1867,) states, that the only form of true cancer invading the upper jaw is, in his experience, the medullary or encephaloid; although cases are on record, and specimens are preserved, which exhibit the variety of scirrhus or hard cancer. This experience is in accord with that of the surgeons of this country.

The important point to be considered in the treatment of malignant diseases of the upper jaw, relates to the time at which the surgeon

interferes. The great tendency to return, on the part of carcinomatous growth, affords but little hope of permanent benefit; this hope is increased when the bone is removed at an early period of the disease, before it has infiltrated the surrounding structures. Nothing short of the removal of the entire bone suffices.

Dr. Atlee recommends very highly the long-continued administration of arsenic after operations for the removal of carcinomatous tumours. His success in arresting the growth of these tumours, and in modifying their character, has been most marked.

The different methods of operation which have been employed in excision of the upper jaw were described, and the instruments required in performing the operation were exhibited. Sometimes hemorrhage is excessive in these cases, and it is, therefore, advisable to have at hand hemostatic remedies and the actual cautery.

November 23d, 1870.

Prof. Mears presented two specimens, exhibiting tumours of the lower jaw, and made the following remarks upon the forms of tumours developed in connection with this bone. They are the same as those which are found in the superior maxilla, with the addition of the cystic variety, which corresponds to cystic disease of the antrum.

Fibrous tumours occur most frequently, and may be developed either internally or externally, that is, they may originate in the endosteum or periosteum. In many cases, the cause can be directly traced to periodontal irritation, consequent upon retention of diseased teeth in the jaw. Where the tumours are large, operative interference for the removal of both tumour and teeth is demanded. If of small size, the extraction of the offending teeth may be sufficient to arrest the development.

Fibroid-recurrent tumours occur rarely, and differ from the simple fibrous, in the fact that they possess a trace of malignancy, manifest a disposition to ulcerate, and recur after most careful excision.

Fibro-cellular tumour, or osteo-sarcoma.—This variety is characterized by excessive development, attaining, if unchecked, enormous size. It is developed internally, and as it grows, forces its way out through the external plate of the bone. It does not become incorporated with the surrounding structures, and can be readily enucleated from its bed. Microscopic examination shows it to consist of a fine fibrinous stroma, in which numerous cells are imbedded. The name, osteo-sarcoma, has been applied to this form, owing to the presence, frequently, of spiculæ of bone, or grains of earthy matter scattered throughout the mass.

Fibro-cystic tumour, or cystic sarcoma.—In these growths exist a large

number of cysts, which distinguishes them from the fibrous or fibro-cellular tumours, in which are found occasional cysts.

Myeloid tumours occur frequently in the lower jaw, being developed between the plates of the bone. They possess a characteristic colour, described by writers as a dark maroon or claret colour. The internal structure closely resembles the tissue of healthy spleen, and, under the microscope, are found the large giant cells. Their growth is similar to that of fibrous tumours of the lower jaw.

Cartilaginous tumours are of rare occurrence, and present two forms, the endosteal and periosteal, as in case of fibrous tumours. In the endosteal form, the tumour occupies the space between the plates of the bone, and the teeth are imbedded in it. The periosteal variety takes its origin from the periosteum covering the bone, and involving the body also. This variety attains an enormous size, and frequently terminates the life of the patient, by interference with the function of respiration. Sometimes cartilaginous growths undergo the process of ossification and form the cancellated variety of osseous tumours.

Osseous tumours are of two kinds, cancellated and ivory exostosis. The former, as stated above, is the result frequently of the ossification of the cartilaginous or enchondromatous tumours. The latter locates itself most frequently upon the angle of the bone, and, in texture, is as hard and heavy as ivory.

Cancerous tumours attack the inferior maxilla quite frequently, and occur in the varieties of scirrhus and medullary or encephaloid. The former is comparatively rare, the latter being the ordinary form of malignant disease affecting this bone. It begins usually in the interior of the bone and breaks through into the mouth, and, if not checked, through the skin of the face.

Scirrhus, in distinction to encephaloid, begins in the periosteum, and manifests all the symptoms of the disease as found in other parts.

Cystic disease of the inferior maxilla, has been designated by surgeons as spina ventosa. The cysts occur in the spongy tissue of the bone, apparently without any immediate connection with the teeth, but, no doubt, they are developed by reason of some irritation produced by these organs. They differ from cysts of the antrum, in that the latter take their origin from the lining membrane of this cavity. They are of slow growth, painless, and afford inconvenience merely by their size. The anterior plate of the bone gradually yields to the pressure exerted by the increasing fluid contents of the cysts, and a large smooth tumour is formed, over which the integument is movable. Their character is readily ascertained by making pressure over the thin walls of the tumour, which elicits a peculiar, crackling sound, diagnostic of this form of disease.

In regard to the treatment of tumours of the lower jaw, Prof. Mears remarked, that much progress had been made, in this respect, during the past few years. Formerly, many jaws were sacrificed, which are, to-day, saved, and this is due to the increased knowledge possessed in reference to the nature of affections of the jaws. One of the specimens on the table illustrated the truth of his remarks; it exhibited a cyst of the inferior maxilla, involving the left ramus, and for which the third of the bone had been removed. The surgeon of to-day, accepting the excellent suggestions of the late Dr. J. Mason Warren, of Boston, adopts a more conservative practice; according to the recommendations of that distinguished surgeon, the cyst is punctured, the contents evacuated, and the cavity obliterated by crushing in its walls.

The other forms of tumours are treated in a like conservative manner. In the endosteal variety, the outer plate of the bone is removed, and the tumour detached. In periosteal growths, the mass is separated from the bone, or it may require the removal of the external plate. In all forms of benign tumours, the rule is imperative to save as much of the bone as possible.

In the operation for removal of tumours of the lower jaw, much improvement has been made in the character of the incisions. If practicable, the incisions are made in the mouth, so as to avoid disfigurement. If an external incision is required, it should be made along the inferior border of the bone, so that the resulting cicatrix may be concealed from view.

The specimens presented to the class were kindly placed at the disposal of Prof. Mears by Prof. Gross, the eminent surgeon and teacher. One, as alluded to above, exhibited cystic disease of the ramus of the inferior maxilla—the other was a specimen of cystic sarcoma of the lower jaw. The former had no history; the history accompanying the latter specimen was read, and the microscopic structure described.

CASE OF ALVEOLAR ABSCESS.

December 8th, 1870.

Through the kindness of a member of the class, Prof. Mears was afforded the opportunity of presenting to the class a very interesting case of alveolar abscess.

The following is the history of the case: C. E., æt. 16, native of Philadelphia, is employed in a button factory; family history good; the patient has enjoyed good health. Three weeks since a dentist made an attempt to extract the second molar tooth of the lower jaw and failed, leaving the roots in the alveolus. The patient experienced no difficulty from it until four days ago, at which time he was exposed to cold, and

shortly after had pain in the roots, accompanied by swelling of the face. Under the use of local application, the swelling subsided. A few days after, being again exposed to cold, the swelling rapidly increased, giving him much pain and preventing rest at night. For the relief of this condition he presented himself at the dental clinic. A member of the class, taking the case in charge, made an incision along the border of the alveolar process, for the purpose of evacuating the abscess. No pus escaped, and, on the day following, he brought the case to the surgical clinic.

The following remarks were made upon this case: "This case, gentlemen, presents itself at a very appropriate time. You will remember that the subject of yesterday's lecture was that of alveolar abscess, at which time we studied the cause, symptoms and treatment of this affection. We could not desire a better case to illustrate the subject under consideration. The history furnished by the patient is very clear, and you can readily trace the progress of the disease from its inception to the present condition. You will observe there is a large tumour, occupying the lower part of the left cheek, and upper part of the left side of the neck; it is more prominent below, and, in this portion, presents, on the surface, one or two projections. At these points the tumour feels soft, and imparts to the fingers a sensation of fluctuation. The eyelids of the left eye are swollen, and the swelling encroaches upon the left side of the nose. These conditions give a distorted appearance to his face. The tumour has a dusky-red color, and, on applying the hand to its surface, it feels hot.

"Now, let us explore the cavity of the mouth. You will observe that the patient is unable to open it to any great extent—scarcely sufficient room is afforded to introduce the finger, with which is detected the alveolus containing the diseased fangs. The space between the alveolar process of the bone and the cheek is obliterated. The mucous membrane is on a level with the margin of the teeth, and the relation of the parts much changed by the swelling. The patient complains of great pain, and this, taken in connection with the swelling, heat and redness, furnishes us with all the symptoms of inflammation.

"Let us examine into the cause of this inflammation, and, if possible, trace its progress to the present time. We can correctly say that there exist two causes—a remote and an immediate or exciting cause. We discover the first in the diseased roots of the molar tooth left by the dentist. The cold exerting its influence on these diseased fangs became the immediate cause. As the result of this, inflammation attacked the periosteum, lining the alveolus and peridental membrane of the tooth. Exudation occurred, and, finally, suppuration—an abscess being formed at the bottom of the alveolus. The inflammatory action continuing, the formation of pus increased, forced its way through the wall of the alveolus

and endeavored to reach the surface, involving the surrounding structures in its course. You will see that it has reached the surface at this point, and is prevented from escaping by a thin wall. You will remember what was said to you in regard to the mode of exit of pus; it must escape, and usually seeks a route in which least resistance is offered, destroying everything before it. It may be in this case that inflammation was excited in the periosteum lining the external surface of the alveolar process about the region of the molar teeth, the process being injured, somewhat, in the efforts made at extraction, and, in this way, the extensive involvement of the surrounding tissues may be explained.

“The treatment to be adopted in these cases depends upon the time at which the patient presents himself. If, in the early stage of the inflammation, the treatment consists in the prompt removal of the offending tooth or fangs, the free bleeding of the parts, and the employment of other antiphlogistic remedies. If suppuration has occurred, and abscess has formed, the pus should be evacuated by incisions within the mouth, so as to avoid disfigurement. This is an important consideration, and should always be borne in mind. An unsuccessful attempt to accomplish this was made in this case. Now, it is impossible to avoid making an external incision, owing to the extreme tenuity and devitalized condition of the external wall of the abscess. In a few hours the pus will burst through this thin wall, and will produce a ragged opening; therefore, it is our duty to make a clean incision, in order that as little disfigurement as possible may result. You will recall the remarks made in regard to the application of poultices upon the external surface in cases of alveolar abscess. They should not be employed, for they lower the vitality of the part, and invite the pus to the surface.”

A free incision was made into the abscess, and about six ounces of very offensive pus discharged. The patient was directed to keep applied to the surface an emollient poultice, and avoid exposure to cold. As soon as the mouth could be readily opened, the fangs of the tooth were extracted.

NECROSIS OF THE SUPERIOR MAXILLA, ACCOMPANIED BY SUPPURATION IN
THE ANTRUM—OPERATION FOR REMOVAL.

December 21st, 1870.

Professor Truman has kindly sent this patient to the clinic, who gives the following history: C. R., æt. 37, native of England, married; present occupation that of a house servant; was in the English army for twelve years, doing duty most of the time as officer's servant; family and personal history good. When eighteen years of age had a non-infecting

chancre; at this time he was under treatment about three months, and supposed that he took mercury. The two bicuspid and first molar teeth of left superior maxilla being worn down, he went, in the latter part of April last, to a dentist, and had them extracted. They were not carious, and gave him no pain. He thinks that they were extracted without difficulty. About ten days after he felt a dull, gnawing pain in the cavity of the first bicuspid, and this increasing, he went to the dentist, requesting a careful examination, under the impression that the pain was due to the presence of a fang left in the cavity at the time of the extraction. This was done, and nothing found to account for the pain. A few days after he observed swelling of that side of the face, and on the advice of a physician whom he consulted, the second molar tooth was extracted. The roots of this tooth had "barbs" on them. A few days later pus came out of his nose. On announcing this symptom to the dentist, he was informed that he had disease of the antrum, and was advised to consult Professor Truman. On examination, Professor Truman found the alveolus in a state of inflammation, and an opening through the cavity of the first bicuspid into the antrum, which he enlarged, and directed the patient to inject into the cavity, through this opening, medicated lotions. The inflammation was much reduced under this treatment, and the cavity kept clean.

"Having now the history of the case, you are prepared to examine it, and determine the nature of the disease. You will readily distinguish the swelling of the left side of the face, and detect also a slight defect in the articulation of the patient. On examining the mouth, you will observe that the two bicuspid and first and second molar teeth of the left superior maxilla are removed; the lateral incisor and canine teeth are loose, the third molar is firm; between the lateral incisor and the molar teeth there is a large portion of the alveolar process exposed; its surface is spongy, and pus exudes at certain points between the bone and the gum. This portion of the bone can be moved in its position; it has fallen into the mouth, as it were, and has depressed a portion of the palatal vault. The line of demarcation between the bone and the necrosed portion is well marked. The patient states that fluid injected into the antrum passes into the left nostril. Examination of the nostril shows it to be free.

"Where has been the original seat of disease in this case? The patient states that he felt a dull, gnawing pain in the cavity of the first bicuspid about ten days after the extraction of the teeth. A few days later he observed swelling of the gum of that side of the jaw, and in three or four days pus escaped from the gums and from the nostril. It would appear, therefore, that the alveolus was primarily involved, periostitis having been excited, and necrosis of the bone following. In the course of this inflam-

matory action, the antrum became involved, by reason of the involvement of its floor, which, you know, is formed by the alveolar process.

“Let us inquire into the cause. In regard to any injury inflicted at the time of the extraction, we have the statement of the patient to the effect that none occurred. He states that the extraction was effected without difficulty. You will remember, he states in his history that, at the age of eighteen, he had a chancre, followed by suppurating buboes, for the treatment of which disease he supposes he took mercury. If we regard this chancre as non-infecting, in this respect adopting the views entertained by some syphilographers, then we must exclude any syphilitic taint as exerting an influence in the production of the disease. In connection with this point, it is interesting to note the experience of Professor Truman, who informs me that in almost all cases coming under his observation, in which periostitis has followed extraction, he has been able to trace a syphilitic history. It sometimes happens that, after extraction of teeth, patients expose themselves to the influence of cold, and in this way inflammation is excited. Such may have been the cause in this case. The history of the case excludes the consideration of the poison of the exanthematous diseases, and of the fumes of phosphorus as causes.

“In our last lecture we studied the subject of necrosis, examining carefully into the causes, symptoms and treatment. On that occasion it was stated that the upper jaw was less liable to necrosis than the lower, and the immunity enjoyed by the upper, as compared with the lower jaw, is stated by Mr. Heath to be due partly to its less exposed position, and to the fact that necrosis occurs less frequently in cancellous than in compact bone. He also thinks that the difference in the vascularity of the two bones must exert an influence, the upper having a much larger vascular supply than the lower jaw. Necrosis is the result of periostitis, and the causes and early symptoms are those of inflammation of the periosteum. If the inflammatory action continues, an effusion occurs between the periosteum and bone, which degenerates into pus, and separates the membrane from the bone, and by thus cutting off the vascular supply causes the death of the bone. The importance of early interference, in order to prevent suppuration, was dwelt upon. If this occurs, you were advised to give free exit to the pent-up matter, with a view to limit the necrotic action. In the case of the upper jaw, the tendency of the pus is to open into the mouth, while in the lower jaw it reaches the surface by numerous openings along the lower margin of the bone, and sometimes at a distance down the neck.

“The effect of necrosis upon the teeth is seen in this case; the lateral incisor and canine being loose, and producing discomfort to the patient. Sometimes the involvement of the bone may be such as to leave the teeth

intact, the dead bone being removed without disturbing them. In the case of young subjects, an important consideration relates to the destruction of the germs of the permanent teeth. A specimen was exhibited to the class at the last lecture, showing necrosis of the alveolar border, in which the germs of the second teeth were preserved.

“The treatment in cases of necrosis consists, in the early stages, in combating the periostitis, by removal of the cause and free incisions into the periosteum. When suppuration has occurred, the pus should be early evacuated, in order to limit the destruction of bone. Nature constantly resists the necrotic action, and finally succeeds in establishing a line of demarcation, separating the dead from the living bone. When this has occurred, it is the duty of the surgeon to interfere and remove the dead bone, which acts as a foreign substance, and maintains the suppurative action. The dead bone, called technically the sequestrum, should be removed by incisions made within the mouth. In cases of necrosis of the entire bone, it may be necessary to resort to external incisions. It is important, in operations for removal of the sequestrum, to preserve as much of the periosteum as possible, as this membrane plays an important part in the reparative process.

“A marked difference exists in reference to the repair following necrosis, as it occurs in the upper and lower jaws. Careful researches have shown that, in the superior maxilla of young subjects, a development of fibrous tissue takes place after loss of substance. In adult life, it is stated that no effort at repair is made. M. Ollier, of Lyons, widely known in connection with the most careful and extended investigations upon this subject, notes in his work (*“La Regeneration des Os,”* 1867,) two cases. In one, a certain amount of new bone was produced; in the other there was a development of osteo-fibrous tissue.

“In the lower jaw the reparative process occurs very rapidly, and cases are recorded in which the entire bone has been reproduced after removal for necrosis.”

The patient was now placed under the influence of the anæsthetic mixture recommended by Dr. W. L. Atlee, consisting of one part of chloroform to two parts of ether, liquid measure, and a cork, which was securely fastened to a cord, was introduced between the teeth on the sound side; incisions were made on each side of the alveolus, the periosteum dissected up by the handle of the knife, constructed for that purpose, and the sequestrum grasped firmly by the forceps, and removed. Very little hemorrhage occurred. The case will be shown to the class from time to time, and the progress noted.

Dental Associations.

REPORT OF PROCEEDINGS OF PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

An adjourned monthly meeting of the Pennsylvania Association of Dental Surgeons, was held in Philadelphia, October 18th, 1870, Dr. Wildman in the chair. In the absence of the Secretary, E. R. Pettit was appointed Secretary *pro tem*.

The subject for discussion for the evening was, whether or not vulcanized red rubber contains any free mercury.

In opening the discussion, Dr. Wildman stated that he had treated the vulcanized red rubber, of different manufacturers, with chemically pure nitric acid, allowing it to stand for several days, then filtering and evaporating, leaving it, however, slightly acidulated. He had then tried the effect of this residue upon polished copper, and had found that the characteristic white spot remained upon the copper, showing the presence of free mercury. This is considered the best test. This test was also made before the Association, and resulted as above. The whalebone rubber also presented the white stain, but not in so marked a degree as the others. He was satisfied, from this test, that there was a minute portion of free mercury in the vulcanized red rubber. He also exhibited several specimens of vulcanized rubber under the microscope, in all of which, upon careful examination, globules of mercury could be seen. He said a little care was required to distinguish the globules of mercury from the crystals of sulphur, always present—the former presenting a bright metallic lustre.

Dr. Buckingham asked, if, after treating the sulphide of mercury with nitric acid, the same result was produced.

Dr. Wildman, in reply, stated that he had treated the sulphide of mercury, also, with pure nitric acid, and tested it upon the polished copper, but without other effect than the action of the nitric acid upon the copper. No white stain remained.

Dr. Buckingham said, two questions presented themselves, namely, whether the sulphide of mercury used to color the rubber was pure, or contained some free mercury, or whether it was decomposed at the temperature at which the rubber was vulcanized. The books say it is not decomposed at a much less temperature than 600° F. He had no doubt it was decomposed. He doubted if there were sufficient free mercury in it to produce any effect, either local or constitutional. He did not think the free mercury, if present, could get out of the rubber. That on the surface would soon be either dissolved or volatilized. It may be injurious in certain cases, but it was not proven that it is injurious in all. There was

no doubt in his mind that the vulcanized rubber contained some free mercury. He thought some rubber contained inferior vermilion. Rubber plates, worn in the mouth, change in a few years, either by time or the action of the saliva, or in some manner not known. They also change when kept on hand for a long time, but not in use. The secretions of the mouth get in between the teeth and the rubber, and the gases formed may act upon the free mercury in the rubber. He believed vulcanite rubber as a base for artificial teeth to be a bad thing in most cases.

Dr. Wildman stated that he had experimented with the Hard Rubber Co.'s rubber, vulcanized at 280° F., and found the same condition to exist, *i. e.*, the slight decomposition of the sulphide of mercury. A specimen of this Company's rubber, vulcanized at 280° F., was exhibited under the microscope, showing globules of mercury.

Dr. Buckingham spoke of some rubber in the market a few years ago, which, when vulcanized, became black in spots. He supposed it had been colored with red lead.

Dr. Wildman said he had tried coloring rubber with red lead as an experiment, and found it produced a black color when vulcanized.

Dr. Buckingham thought the only real test, as to whether the vulcanite base was injurious or not, was its use in the mouth. He had not seen, in his own practice, any marked case of injurious effects. He thought silver plates were better than rubber, if kept clean. Rubber plates, if not kept clean, become coated, and this coating would be some protection from the action of the mercury. Black rubber might be substituted for the red with advantage, or the rubber and sulphur without any coloring matter whatever. He thought the whalebone rubber had some kind of gum mixed with it, which gave it its elasticity.

Dr. Henry Moore thought all persons could not wear rubber plates. He mentioned a case of a lady who had worn a gold plate for some years, when she had a rubber plate made. Her mouth soon became sore and she became quite sick. When the rubber plate was left out for a few days she got well: but upon replacing it her mouth became sore again. This was repeated twice, when she returned to gold, and experienced no further evil effects.

Dr. Githens instanced a case of a lady who had worn a gold plate for several years, and then procured a rubber plate. Ever since she had been wearing it she had complained of a stinging sensation in the mouth. The mouth presented a perfectly healthy appearance. He had seen cases of sore mouth from wearing silver plates.

Dr. Wildman thought the trouble arose from the rubber being a non-conductor of heat.

Dr. Buckingham mentioned a case, in his own practice, of a lady who

had worn a rubber plate for a year, and, during that time, had complained of a burning, stinging sensation in the mouth, but only sufficient to be annoying. The mouth appears healthy.

Dr. Wm. H. Trueman thought the testimony of patients unreliable in regard to the effects of mercury. He related a case where a patient had an amalgam filling inserted, and, some six or eight months after, suffered all the symptoms of salivation, copious flow of saliva, inflamed gums, &c., for several days. Upon making an examination, he found the filling was out, and from the appearance of the cavity it had been out for *some time before the trouble commenced*. On being assured the plug was no longer there, the symptoms entirely subsided, and the patient fully recovered, although several fillings of the same material still remained. The immediate cause of the trouble in this case was the patient's reading an account published in the newspaper of a young lady being poisoned by the presence of several amalgam fillings in her mouth. Recollecting that she had one inserted a few months before, she almost immediately began to notice the evil effects of mercury, and in a short time salivation occurred, from *mercury on the brain*! The swelling and turgidity of the gums was, no doubt, due to the constant "sucking," or continued forced expectoration. He thought it possible the mercury in rubber might sometimes operate in the same way. He was not convinced that there was free mercury in the rubber. He had not been able to find its peculiar characteristics under the microscope. He thought the metallic lustre was due to minute particles of quartz, or to the oxide of zinc used in its manufacture.

Dr. Wildman said nitric acid would not act upon vermilion at all. His experience had been entirely different from Dr. W. H. Trueman's. He had first noticed the globules of mercury about two years ago, when, in scraping some vulcanized rubber, he observed a bright spot which proved to be a globule of mercury, which he removed with a needle. He had noticed the same since. He had no doubt there was free mercury in the vulcanized red rubber.

Dr. W. H. Trueman said he had tested it with gold foil, and had not succeeded in obtaining any discoloration.

Dr. Githens asked why, if there was free mercury in rubber, gold could be vulcanized in contact with it without change?

Dr. Wildman doubted if the mercury produced any injurious effects.

Dr. Wert thought there was often inflammation of the mucous membrane of the mouth, extending from the throat, and if a plate was worn it might be attributed to that. When a person had been once salivated, he thought he was more susceptible to the influence of mercury.

Dr. Wildman said, in preparing the specimens for the microscope, they

must be shaved down, but not polished, as that removed the globules of mercury. He also exhibited, under the microscope, an interesting specimen of fungous gum from the cavity of a bicuspid tooth, showing a peculiar fimbriated structure and looped blood-vessels.

Adjourned.

E. R. PETTIT, *Secretary pro tem.*

THE CHARLESTON DENTAL ASSOCIATION.

At the anniversary meeting of this association, held on the 20th of December, 1870, the following officers were elected to serve for the ensuing year :

President—Theodore F. Chupein, vice W. S. Brown, who declined re-election.

Vice-President—George H. Winkler.

Secretary and Treasurer—B. A. Muckenfuss.

Editorial.

TO OUR PATRONS, FRIENDS AND CONTRIBUTORS.

Again, for the seventh time, we present our congratulations, and wish our patrons, friends and contributors a Happy New Year, expressing, at the same time, our desire for their prosperity and success. When we look back to the earlier years of our editorial career, we remember, with gratitude, the kind friends who have stood by our journal, and, by their voice and pen, aided us in our efforts to stem the current of opposition which met us at the outset, and which has ever since, in certain influential quarters, been exerted against us, and whose constant effort has been to ignore our labors, and misrepresent the institution with which we are connected. As a sample of this kind of underhand action, we append the following notice, which is sent as *truth* from this country to the *London Times*, and is then re-published in the American papers :

“ An American writer, in the *London Times*, of November 28th, thus refers to our Philadelphia dental colleges : ‘ A few days ago the winter terms began at the various dental colleges in this country, a fact that reminds me that, while Americans of culture, to finish their education, usually go to the Universities of Europe, in the specialty of dentistry the current is reversed, the graduates of the highest medical schools abroad coming to the United States, and chiefly to Philadelphia, to finish their dental education. There are in the United States nine dental schools, two being in Philadelphia, two at Boston, and one each at New York, New Orleans, Baltimore, St. Louis and Cincinnati. Two-thirds of all the students attend the two colleges in this city, of which the ‘ Philadelphia Dental

College' is the chief, and it is noticed that about one-fourth of the students at this college are generally from abroad, nearly every country in Europe being represented. Of the high distinction of having graduates from the Universities of London, Vienna and Berlin come here to finish their dental education, the Philadelphians are quite proud, as they also are of the fact that their city contains the most extensive manufactory of dental instruments and artificial teeth in this country, if not in the world.' "

—*Public Ledger*.

In making this quotation, we do not pretend to charge the officers, or faculty of the college mentioned, with making this statement; but we do charge that some friend of their institution has misrepresented our college intentionally. The only reply that we shall make to the article, is to assert positively, and we are prepared to prove the same by our college books:

1st. That for the past seven years the Pennsylvania College of Dental Surgery, has had a larger number of students than any other dental institution in the United States.

2d. That this College has had more foreign students, each session, the past seven years, than any other dental institution in the United States, which, if true, is a sufficient proof of the relative standing of American Colleges in foreign countries. With this answer we shall leave the subject, unless our challenge is accepted.

In presenting our congratulations, we would also state that we shall endeavor to add to the worth of our journal, by the publication of articles of practical interest, several of which are promised from prominent contributors. We shall also publish clinical reports, which will be found to contain valuable information, one of which is published in this number. We again ask the dental public for encouragement, by contributions and subscriptions, promising to make the DENTAL TIMES second to no journal published.

BARNUM'S RUBBER DAM.

We would call attention to the advertisement of our friend Barnum, who is one of the real dental benefactors, as the use of his rubber greatly aids the operator, and enables him to perform his work satisfactorily, without regard to the flowing saliva.

THE CANADA DENTAL JOURNAL,

This journal comes to us laden each month with good articles. The editors, Messrs. Beers and Chittenden, are *live men*, fully awake to the best interests of the dental profession. The *Journal* should be on the table of each dentist in the United States.

G. T. B.

Selections.

ARE THE MINERAL ACIDS FORMED IN THE MOUTH?

BY S. P. CUTLER, M. D., D. D. S.

The above is the heading of an article in the May number of the *Missouri Dental Journal*, 1870.

All publications in the journals are regarded as public property and subject to criticism.

There are some assumptions in the above article, perhaps, not founded on sufficient data to warrant belief, and some of the chemical formulæ not correctly stated. In the first place I will inquire, what constitutes a mineral acid in contra-distinction to any other acid. Sulphuric acid might with propriety be considered a true mineral acid, as one of its elements, sulphur, may be regarded a mineral element, the other element not, though an active agent or element in most acids only a few exceptions, its salts of the metals are minerals. Nitric acid is generally considered a mineral acid, though composed of two gases, neither of which could be regarded as a mineral element *per se*, neither is the acid itself uncombined mineral in character, it being a liquid under all circumstances when uncombined; but on the other hand, when combined with metallic oxides, they are strictly mineral in their character.

This acid may be regarded in one sense as of organic origin, it being formed by animal and vegetable putrefaction, fermentation by oxydation of ammonia, which is first formed in the presence of eight equivalents of nascent oxygen, the ammonia also being nascent; at the same time three equivalents of water are formed in the presence of potash, nitrate of potash is formed; nitric acid is also formed in thunder clouds, which was synthetically proven by Cavendish in 1780. These are the only known sources of nitric acid.

Hydrochloric acid or muriatic acid, also regarded as a mineral acid, is composed of two gaseous bodies, neither of which could be regarded as mineral, the acid being a liquid, its salts of the metals are regarded as minerals, more especially the halogens.

This acid is made by combustion of hydrogen in chlorine in a rapid manner and in a more gradual manner by slow chloridation of hydrogen, or by decomposition of chlorides already formed, which are minerals. Some acids are solids; others are liquid, and others gaseous.

The elements of all the organic acids are found in the mineral acids, namely: carbon, oxygen and hydrogen; which are found in all organic acids, with one exception, that of oxalic, which has no hydrogen.

There are five elements found to exist in organisms which are regarded as organic elements when so existing only. There are a still greater number of simple elements that are never found in organic life, called inorganic, not all of them mineral in their character. Some are metals, others mineral or metalloids, others gaseous. Now, all the elements found in the mineral acids are found in organisms in greater or less quantity, without any exception.

The writer of the article entertains the idea that the mineral acids may be formed in the mouth, and gives his formulæ for the same, based upon the supposed knowledge of the exact specific action of each individual acid on the teeth in the mouth. Whether or not the writer experimented with

teeth out of the mouth, with the different acids named, he does not state. This would be the proper plan in making up his differential diagnosis of decays or action of acids on the teeth.

Now there are three different and distinct forms of dental caries, the black, the brown, and the white, the first being characterized by disintegration of both dentine and dentine, or dentine and cartilage *pari passu*, leaving a discolored surface below, frequently hard and dense from the fact that this is the slowest of all forms of decay, hence more time being allowed for tubuli absorption for a short distance into the dentine below the decay, of coloring matters, and not from any specific acid action differing from either of the others; if so, I have not yet had convincing proof of the fact.

The brown variety is characterized by a removal of the lime salts down to an indefinite distance below or into the cartilage. In such cases the lime gives way faster than the animal portion, that being more resistant to such action than the lime, leaving us to conclude that the dissolved lime was in a more perfectly soluble condition than the former variety, and we might in consequence readily infer the action of either nitric, muriatic, or acetic acids in the latter case, and that of sulphuric in the former, the first three all being soluble salts, and the latter scarcely at all so. These inferences are not dicta, only hypothesis.

The white variety is more rapid and destructive than either of the others, being characterized by a softening of the whole substance of the dentine as far as the decay reaches, which easily chips away under the excavator, and is generally quite sensitive to the touch of the instrument, the line of demarcation not being readily determined by any one of limited experience, and in many instances not by the most expert and experienced, hence the result more doubtful and uncertain when filled. This variety is more especially confined to young subjects, not often met with in extreme old age. This latter or white variety does not slough away, as in the black, but remains in a more or less complete disorganized condition, not being removed *pari passu*, with the progress of the disintegration.

In the brown variety, the cartilage being retained, may be easily peeled up from the sound dentine below the cartilage so removed, showing under the microscope the tubular structure more or less intact, generally portions of them being corroded out from end to end, presenting a strongly marked baccated or beaded appearance, and I have entertained the idea that portions of such softening dentine, over the pulp cavity, in large decays, might be retained as a capping, far superior to any artificial capping, with a hope barely of subsequent ossification of this softened dentine, especially where there are live nerve fibrils, as we have reason to believe is sometimes the case where this softened portion remains sensitive to the touch, at least, no harm could be apprehended from leaving a small portion where the borders of such cavities are sufficiently excavated.

I might extend these remarks, but for the fact that I like short articles, so as not to bore my readers.

Now in relation to the chemical formulæ given in the article under consideration, there are some broad mistakes or errors in the nomenclature, perhaps from want of care in making them up or oversight, which I propose noticing in detail.

First formula: sulphuric acid, H_2SO_4 . As its formula indicates, it is 2 parts of hydrogen, by weight 32 of oxygen, 16 of sulphur. Now let us

see how the facts stand. It will be seen by reference to any of the text-books on chemistry that sulphuric acid consists of $S O_3 + H O$; or sulphur, 16; oxygen, 24; and one equivalent of water, $H O$: or one part by atomic weight of hydrogen, and eight of oxygen, which is the hydrous acid; the unhydrous contains no water, and is a white solid, instead of a liquid form, E_{40} . The Nordhausen oil of vitrol consists of two atoms of acid and one of water, thus $(S O_3 H O + S O_3)$ equivalent to 89. This is the fuming sulphuric acid. It contains only half the amount of water, the equivalent of the common commercial acid being 49; the unhydrous being 40.

Let any person at all acquainted with chemical manipulation examine the formulæ given for the formation of this acid in the mouth, he will at once come to the conclusion that it might be impossible for any such formation to take place, even if the necessary elements be present, the requisite conditions will be found wanting.

This acid is made on a large scale by burning sulphur with nitrate of potash or soda, and conducting the sulphurous and nitrous acids which result into large chambers lined with lead, in which steam is thrown, the bottom of the chamber being covered with water. The sulphurous acid takes oxygen from the nitrous acid, reducing it to deutoxide of nitrogen. This being in the presence of oxygen in the chamber, the deutoxide instantly reassumes the condition of nitrous acid. The deutoxide continually transfers oxygen from the atmospheric air to the sulphurous acid, and brings it to the condition of sulphuric acid. Thus it will at once be seen that this acid could not be found in the mouth, the requisite conditions being wanting, even if the elements be present.

The writer says, if a fibre of meat be caught and retained between the teeth sufficient time, it decomposes part of its hydrogen uniting with part of the nitrogen, forming $N H_3$; its carbon uniting with part of the oxygen, forming carbonic acid, acid, $C O_2$; and the sulphur combining with the remaining hydrogen, forming sulphuretted hydrogen, $H_2 S$. Now sulphuretted hydrogen in contact with oxygen of the air, is decomposed, the hydrogen uniting with the oxygen, forming water, and the sulphur set free. This sulphur being in the nascent state, and having a great affinity for oxygen, is oxidized, and the result is sulphurous acid, $S O_2$; which is converted rapidly into sulphuric acid, in the presence of the water of the saliva, thus: $S O_2 + 2 H_2 O = H_2 O_4 S + 2 H$. "The acid thus formed immediately acts on the carbonate of lime, decomposing it, and charring the animal portion." The formula for sulphuretted hydrogen is $H. S.$, and not 2 atoms of hydrogen, as above given. This feeble acid gradually undergoes decomposition in water, forming water and sulphur set free, but does not readily undergo decomposition in the air, more especially in dry air. The equivalent of this acid is 17, instead of 18, as the above writer would express. The above formula for the formation of sulphuric acid from sulphuretted hydrogen will not do as he has there given, 3 parts of sulphur, 8 of oxygen, 10 of hydrogen, which is too high.

If it were possible for sulphuric acid to be formed at all out of hydro-sulphurous acid, the formula would read thus: $S H H O O_3 = S O_2 + O H O$. Or in other words, a hydrated ter-oxide of sulphurous acid, making one part of sulphur, two of hydrogen, and four of oxygen, instead of 8 of oxygen, 3 of sulphur, and 10 of hydrogen, as given in the writer's formula

above. I cannot see how this acid could be possibly formed in the mouth at all.

Nitric acid symbol, H N O_3 , as given by the writer, is not correctly stated, though corrected in the description below. Its symbol is $\text{N O}_5 + \text{H O}$, equal to 54 unhydrous, and as it always contains one equivalent of water, would be 9 equivalents more added, is the exact formula of the books. The author says: "It is commonly prepared by the action of sulphuric acid upon potassium nitrate; the reaction is as follows: $\text{K O}_3 \text{N} + \text{H}_2 \text{O}_4 \text{S} = \text{K H O}_4 \text{S} + \text{H N O}_3$." None of these formulæ are correctly given; he has given one equivalent of K, one of N, and one of S, which is correct, and two of H and 7 of O, which is incorrect, and does not contain enough, lacking three equivalents; neither are the groupings correct from beginning to end.

He further says it decomposes the carbonate of lime, setting the carbonic acid free, forming nitrate of lime and water, thus: $\text{Ca O}_3 \text{C} + 2 \text{H N O}_3 = \text{Ca 2 N O}_3 + \text{C O}_2 + \text{H}_2 \text{O}$. Now none of these formulæ are correctly given; the correct formula is $\text{Ca O} + \text{C O}_2 + \text{N O}_5 + \text{H O} = \text{Ca O} + \text{N O}_5 + \text{H O O}_2$. It will be seen that the author has given one equivalent too much of hydrogen. He states that the acid decomposes the carbonate of lime and dissolves out the phosphate of lime, but cannot decompose it, and destroys the animal portion. I will advert to this further on. A piece of meat between the teeth, undergoing decomposition, might set free the elements to form nitric acid; but we have no proof of its formation in the mouth in this or any other way, and I doubt the possibility.

Hydrochloric acid symbol, H Cl . He says this acts energetically on the teeth. This is certainly true, as this is a very destructive agent when in contact with the teeth, either in or out of the mouth. His formula is not correct in point of atoms of equivalents, and not put together in the most intelligent manner, thus: $\text{Ca O}_3 \text{C} + 2 \text{H Cl} = \text{Ca Cl}_2 + \text{H}_2 \text{O C O}$. The more accurate statement would be thus: $\text{Ca O C O}_2 + \text{H Cl} = \text{Ca Cl} + \text{C O}_2 + \text{H O}$; that is, the oxygen of the oxide of lime in union with carbonic acid would be replaced by chlorine, and the carbonic acid gas and water formed and set free. The atom of oxygen of the lime is liberated, and at the same time the hydrochloric acid being decomposed, its hydrogen uniting with the liberated oxygen, forming water and chloride of lime, carbonic acid escapes as gas.

The error in the writer's formula is in giving 2 atoms of hydrochloric acid instead of one, and also the resultant bichloride of lime instead of protochloride. He has not given oxygen enough to unite with his carbon and hydrogen to form two atoms of water and one of carbonic acid.

Chemical nomenclature is exact and definite in its terms, every letter and figure having a specific value under all circumstances.

Now, the writer maintains that none of the three strongest of acids has any power to decompose the phosphate of lime in the tooth substance, and that only the carbonate is decomposed, and the phosphate dissolved, notwithstanding the carbonate forms a small per cent. of the tooth substance, only $5\frac{1}{2}$ part in the hundred. We have no facts to prove that two salts of lime in the tooth composition are themselves chemically united before or after entering into tooth composition; if so, even perhaps the removal of the carbonic acid, if such could be possible, would not cause the phosphate to dissolve out in the presence of a weak acid, reactions such as may and do exist in the mouth, causing the destruction of teeth.

What are the facts in the case? It is known to analytical chemists that each and all of the acids spoken of are capable of acting on tooth substance and decomposing the phosphate of lime as well as the carbonate. The phosphate of lime found in the bones and teeth is a tribasic or neutral salt of lime; that is, three equivalents of lime unite with one equivalent of phosphoric acid, which forms an insoluble salt of lime, sometimes called basic salt.

Now, when sulphuric acid is added to teeth or bones, the acid having a strong affinity for lime, one equivalent of the acids unites with one equivalent of the tribasic phosphate of lime, forming an equivalent of sulphate of lime, leaving two equivalents of lime in union with the phosphoric acid, forming a bibasic phosphate, which is now an acid salt and also a soluble salt, which is readily dissolved away by water or almost any other fluid; at the same time the carbonate of lime is converted into a sulphate, not at first in a crystalline condition. What has been said of sulphuric may be said of nitric, muriatic, and even other acids. They may all be supposed to act in the same way, which is in fact already proven by experiments on bones, in the manufacture of artificial manures, besides various other experiments by the ablest chemists.

All of the three mineral acids have strong affinities for water, and readily remove it from all organic tissues, more actively so when concentrated, leaving the carbon behind and the organic structure broken up and disorganized, so far as the acid action extends into the substance, readily removing the water or its elements from corks in bottles containing any of the mineral acids, leaving the organic tissue broken up with the carbon—left behind in a disorganized condition, which, when the acid is neutralized and washed out and dried, burns without flame.

The corks or wood so acted on by the different acids are not all the same color; that of sulphuric, dark; that of nitric, light color; the muriatic is also light, but of a different shade, which fact may have left the writer of the article alluded to to the conclusion that the different forms of decay mentioned were the result of the action of the different acids. This fact is not well established, as we sometimes find more than one form of decay in the same mouth at the same time.

The mineral acids undiluted have scarcely any action on metals, owing to the fact that the normal amount of water contained in the undiluted acid, which the acid will not give up readily to the metal to form the requisite oxide, from which the salt is formed free, water must be present, held by the acid by a weak affinity, the water readily uniting with the metal to form an oxide, then the free acid unites with the oxide, atom by atom, to form the salt of the metal.—*The Dental Register*.

PERIODONTITIS.

BY W. H. WAITE, D. D. S., LIVERPOOL, ENGLAND.

The disorder known by the above name consists in an inflamed condition of the investing membrane of the roots of teeth. It may occur on one root only, and in one spot, very circumscribed, or be found extensively spread over nearly the whole surface of the roots. Accompanying this inflammatory state, there is frequently a thickening of the peridental membrane, causing more or less protrusion of the tooth from its socket.

The symptoms are tolerably defined, and the diagnosis easy. If the opposing tooth is *in situ*, pain is experienced in striking the jaws together; while at the same time there is present a desire to grind the teeth, for by so doing a kind of temporary relief is afforded. A gnawing, boring pain, considerably aggravated when the head is laid down, and warm at night—not quite so acute as true toothache (except in the worst stages,) but quite as distressing—having a marked effect on the mental energies, some degree of concomitant inflammation about the gums in the neighborhood, and soreness to the touch—these are the chief features arising in connection with this disease.

Sometimes a patient will be unable to locate the sensations with sufficient precision to indicate the offender, and in such cases, if the teeth are gently tapped, one at a time, with the handle of an excavator, the defaulter will not fail to respond. The causes of this affection enumerated in some of our standard works are various, and, without doubt, periodontitis may proceed from numerous predisposing and exciting causes; still, probably, it would not be unsafe to say that fully 95 per cent. of these cases are attributable either to the presence of a dead pulp, or to the manipulation and treatment employed for the devitalization and extirpation of the pulp. The worst forms of periodontitis are to be found where, the cavity of decay having extended very near to the pulp cavity without actually exposing that organ, a large gold or amalgam filling has been inserted, and by reason of the conduction of thermal sensations through the plug, the pulp has sooner or later lost its vitality. Now, such death of the pulp is speedily followed by the liberation of a foul and irritating gas, which, being confined by the filling, works its way outward through the apex of the nerve canals, and coming into contact with the periosteum, acts as an irritant thereon, inducing determination, congestion, and at length inflammation. Further on the periosteum becomes detached from the root, suppuration commences, and we have as the issue *Alveolar Abscess*.

But seeing that these large fillings of metal alone are apt to produce such unpleasant consequences, we are led to consider the advisability of interposing some non-conductor between the metal and the base of the cavity. Thus, if a gold filling be intended, we may place a layer of oxychloride of zinc, or Hill's Stopping, over the floor, or if an amalgam filling is to be introduced, the oxychloride answers our purpose, and in some such way it seems probable that many large cavities among the ill-fated first molars may not only be filled, but filled with a fair prospect of permanent success. Beyond a doubt, caution and the studious adoption of every preventive measure, are not thrown away in any case of deep-seated caries, for whatever may be the merits of the treatments noted hereafter, it is certainly very annoying to have a patient return shortly after the insertion of a large filling, complaining that "this tooth is so tender, I can't bear to close my mouth."

Remedies as varied as the causes of periodontitis have been suggested from time to time, most of them valuable in some circumstances, and valueless in others. It would seem as though a special bond of sympathy were called into existence between the local affection and the general health of the patient. Cold, disorder of the stomach or bowels, indigestion, rheumatic or gouty tendencies, any and every derangement of the system, appears to act, and be reacted upon by this disease; and often-

times, baffled by the complications, and besought by the patient, we are led to give it up and remove the offending tooth, rather than encounter the apparently endless annoyance.

Happily the extreme cases are not a large majority. If "dead pulp" can be clearly diagnosed, (and the history of the case, taken together with the opacity of the tooth's appearance, will generally afford decisive evidence,) and if the case presents early, say, within two or three days of the commencement of uneasy sensation, there is no quicker or surer method of procuring relief than to remove the filling, open freely into the pulp cavity, and afford a vent for the gas pent up therein, thoroughly cleansing the canals from every particle of dead tissue, and treating with dressing of camphorated spirit, followed by dilute carbolic acid, &c., till all offensive odor has disappeared, and finally, when the condition of health is fully established, filling the canals, and refilling the outer cavity; or, if for any reason it be considered undesirable to remove the filling, (and this may often be the case,) an entrance can be made from the neck of the tooth, just at the margin of the gum, into the pulp cavity, by drilling right in through the bone, with a sharp spear-pointed drill. This is known technically as "odontropy." Drills may be easily made of broken excavators, suitable for this purpose, and, if the tactile sense of the operator is sufficiently acute, he will observe that just as the instrument punctures the pulp-chamber, it will be felt to stick, and by this he will know that the object is accomplished. Frequently, moreover, on inquiry it will be found that the patient has tasted the peculiarly unpleasant gas thus let out into the mouth. As a rule the symptoms rapidly subside after the gas has escaped. Complete restoration may be facilitated by placing a guard of gutta percha on the teeth of the opposite side of the head, to prevent closure of the jaws upon the affected tooth, and so shield it from irritation of that sort; also, by carefully drying the gums, and then painting the part with the officinal tincture of iodine, or the mixture given below. When periodontitis supervenes on devitalization and thorough extirpation, palliative treatment is indicated, free lancing of the gums, copious bleeding, after which cold applications, without and within the mouth, liberal use of iodine, or the iodine and aconite, which last is certainly an excellent remedy. Again, it has been suggested that *Mercurius Vivus*, the third decimal trituration, given in small doses two or three times a day, is a specific in such case. This is also a good medicine, but scarcely infallible. Indeed, it is more than doubtful if anything is absolutely certain. The wise practitioner, however, is ever ready to employ any means which the peculiarities of the case, or the experience of his fellows, may suggest; and in this, as in all other affections, will not be bound by prejudice simply to follow a beaten track, but be ready on occasion to exercise his ingenuity to discover the best treatment for each case as it presents, always bearing in mind the intimate relation that exists between this disorder and nearly every phase of systemic trouble.

Perhaps one of the greatest evils associated with this form of dental disease is the fact that patients do not generally recognize the true cause of their trouble. Neuralgia, or *tic*, as they call it in some places, seems to be a sort of universal scapegoat, on whose back are laid all kinds of dental difficulties, and to get rid of which the patients will swallow any amount of physic before they wake up to realize wherein the mischief truly consists, and then too often the disease has passed into the suppurative stage.

The last hint as to the treatment of periodontitis, therefore, is never to fail in warning a patient of the possible result in every case, where there appears any reason to suppose that sooner or later the disorder may appear.—*Canada Dental Journal*.

ON THE USE OF SKIMMED MILK AS AN EXCLUSIVE DIET IN DISEASE.

BY S. WEIR MITCHELL, M. D., MEMBER OF THE NATIONAL ACADEMY.

My design in this, and the brief papers with which I hope to follow it, is to give my own experience in the use of skimmed milk as an alterative diet in certain cases of disease.

After reading Carel's paper, some years ago, I began to employ this very useful method of treatment, and since then have found repeated reason to congratulate myself upon the success which, in my hands, it has attained whenever the cases for its use were selected with discretion.

In dealing with the subject, I shall first make some general remarks upon the mode of using milk, and upon the effects observed in nearly all cases. Next, I shall relate histories of its employment in gastric disorders, in diarrhœa, in malarious and renal dropsies, and, finally, in nervous maladies. I hope to conclude with a study of the influence of the milk-cure upon the secretions and excretions. In following this path, I shall in some cases differ from Dr. Carel; but, in general, my views will be found to correspond with those held by this physician.

The milk is to be used as free as possible from cream; and if, as is generally the case in our cities, there is an abundance of ice to be had, I prefer to let the milk stand in a well-chilled refrigerator for twenty-four hours. It should then be carefully skimmed, after which it is fit for use. As Carel remarks, the quality of the milk goes for something, and perhaps, too, the surroundings,—since I have found persons who could not bear the treatment in a city, while in the country they thrive under it admirably. As to temperature, it may be given warm—not hot—or cold, as suits the taste. In rare cases, where at first it caused nausea, I have had to use with it more or less lime-water during the first few days. In other instances the repugnance to its taste is a difficulty; and this may be overcome by faintly flavoring it with a few drops of coffee or with caramel. Other patients prefer to add to it a little salt; but, as a rule, I desire to give the milk alone as soon as possible.

Quantity.—The patient takes, to begin with, one or two tablespoonfuls on rising, and every two hours during the day. When I followed Carel's rule of giving at once half a tumbler to a tumblerful (two to six ounces,) four times daily, I found that few patients would bear it without nausea and early disgust. I increase each dose by a tablespoonful every day—say three the second day and four the third day. Thus, if the patient begins at eight A. M., he takes, up to ten P. M., eight doses—that is to say, about sixteen ounces. Now, this is the lower limit; nor have I been able, in the cases of females or delicate men, to give it more largely at first. Indeed, few women of sickly or sedentary habits are able to exceed, at any time, a pint and a half daily. After the fourth day it is best to separate the doses as you increase their amount, until they are taken at four equal intervals daily and the maximum quantity is attained. This

varies greatly: I had one patient, a railroad contractor, who, living an out-door life of the most active kind, took daily for more than a year fourteen tumblers of skimmed milk, and this alone. Two quarts a day is the limit with most of my patients. I suspect, from Carel's account, that Russian patients must have more hardy stomachs.

Where people are well enough to live afoot, I have had little difficulty in the use of the milk; but in very feeble persons—and I have often given it to such—I have found it absolutely necessary to use with it, for a few days, brandy or whiskey, and even beef soup, all of which I expect to abandon so soon as the patient can take milk enough to sustain his strength.

It is needless to say that for a patient to take steadily a diet of skimmed milk alone requires the utmost fortitude, and all the moral aid which the physician can give. Carel thinks the first week the most difficult one, and this is usually the case; but sometimes the whole period of milk-use is one long struggle, even after we begin to allow a partial use of other diet. It is not, in these cases, hunger, but simply the craving for other food which tortures the patients. Most of them avoid the sight of food, in order to control their desires; and in one case I was much amused at a gentleman who said to me, in a guilty tone, "Indeed, doctor, I could not help it, but I stole an egg this morning."

Dr. Carel begins to alter the diet of milk after two or three weeks. I prefer to reach the latter limit before giving other food; but this, after all, is a matter for separate decision in individual cases. My own rule, founded on considerable experience, is this: Dating from the time when the patient begins to take the milk alone, I wish three weeks to elapse before anything be used save milk. After the first week of the period I direct that the milk be taken in just as large amount as the person desires, but *not allowing it to fall below a limit which, for me, is determined in each case by his ceasing to lose weight.* Twenty-one days of absolute milk-diet having passed, with such exception as I shall presently mention, I now give a thin slice of stale white bread thrice a day. After another week I allow rice once a day—about two tablespoonfuls—or a little arrowroot, or both, as circumstances may dictate. At the fifth week I give a chop once a day, and then, in a day or two, another at breakfast; and after the sixth week I expect to return gradually to a diet which should still consist largely of milk for some months. In children I sometimes use raw in place of cooked meat for a time; but grown people will rarely take it, although very often they are willing to take raw soup (Liebig's.)

The symptoms developed under the use of milk are very interesting, and not all of them are told by Carel.

In no case have I seen any one gain weight during the first few days; but where the treatment succeeds, the patient soon ceases to lose, and then slowly gains in weight. This is usually the case in severe gastric and intestinal cases; but in some persons the loss of weight continues even after they are taking an amount of milk usually sufficient to sustain the body in an equilibrium. This is remarkably the case in very fat persons, who, as every one knows, are quite commonly small eaters. Taking three cases of dyspepsia at random, (all women,) I find this record: The first lost in two weeks 14 pounds of a weight of 131; the second lost 18 pounds of 120; and the third, 11 pounds of 117, her total weight at the start. In another case, where the quantity of milk taken was two

quarts daily, and the exercise small, the man lost weight steadily up to the time that I began to give bread, when the gain was immediate and speedy, (case, diarrhœa.) Mrs. S., æt. 47, weight 194 pounds, inactive, sallow, feeble, dyspeptic, and a very small eater, lost, in four weeks, 30 pounds, with general gain in strength and vigor.

The state of the skin has seemed to me to improve in all cases of chronic gastric or intestinal disease, but in others there has been no change. The urine, in a few cases, is somewhat annoying during the first week, the patient having frequent calls; but commonly no such complaint is made, although in certain dropsies I have found the milk to act strictly as a diuretic. The changes in the urine we shall have occasion to study in future.

The tongue is very apt to become furred, and to remain white and rough for two or three weeks, and in some cases so long as milk is taken; but so far is this from representing a disturbed state of stomach that the dyspeptic usually finds himself, after a few days, in the enjoyment of an amount of digestive comfort long a stranger to his viscera.

The stools begin to show the milk tint—a yellowish or salmon hue—after forty-eight hours, and when the milk disagrees they are apt to be loose, while usually they are intensely tough and constipated. This feature of the use of skimmed milk is at times most obstinate and annoying. After some weeks of creamless milk, I have often resorted, in such cases, to unskimmed milk, and with good effect; but it is quite clear that even this, in adults, may constipate, as it never does in the child. Carel says that a little coffee in the morning is often sufficient to relieve the bowels; and, where a small cup of pure coffee can be used, this is true. I give it without sugar. Later in the treatment, fruit, fresh or stewed, may be used; but, as a rule, I find that a little Saratoga water on rising, and a half-grain of aloes with a grain of ginger at night, will answer; or, if these do not, then an enema is required. In some cases this symptom is simply unconquerable by any constant treatment, and twice it has forced me to abandon the milk. In another case—a lady who undertook the milk-cure unassisted—I was sent for on account of violent rectal and sciatic pain which followed every effort at defecation. She said she had had a daily stool, which was true, but the amount passed was trifling, and her rectum was packed with feces so tough as utterly to defy injections until I had mechanically broken up the mass. The pulse is usually quickened until the milk-diet is large enough to sustain the weight unchanged, when it falls again. In certain cases of hypertrophied left ventricle with palpitation of the heart, the immediate effect is to lower the pulse and quiet the heart. The temperature I have only noted in two recent cases. I shall speak of it fully in a future paper. The nervous system is not strikingly affected by milk. I have once only, in a very stout and hysterical lady, seen vertigo and faintness follow its use and forbid its continuance; but, as a rule, it is in such persons soothing alone.

Carel makes no mention of one symptom of which many patients have spoken to me; this is an intense sleepiness. It is common, but not universal, and soon passes away.

In this brief sketch I have told plainly my own experience; and this I shall now illustrate by cases—only some few of which I shall relate in detail.

In no diseases has the value of milk-treatment been more clear than in

certain instances of stomachal disorders. It is needless to add that I have quoted here only such instances as had proved rebellious to all ordinary methods.

T. C., æt. 14, a frail and pallid lad, employed as errand-boy in a sugar-refinery, where he contracted the habit of continually eating sugar. After some weeks he began to have sick stomach, and at length incessant vomiting, for which a variety of treatment was employed without relief. Finally it was found that he was able to keep down small quantities of milk diluted with equal parts of lime-water. The amounts taken were still too small to sustain life, and he wasted rapidly. At this time he fell under my care, and was at once put upon an exclusive diet of skimmed milk, taking two tablespoonfuls every two hours. The vomiting ceased at once, and as the milk was increased in amount and the interval lengthened he began, in a week, to gain weight. In two weeks he was doing well on a quart a day, and at the twenty-first day he began to take bread. At the fourth week a chop was added, and at the fifth week he went to the country. At this time he was gaining weight and color. He felt none of the gastric distress after the third day, but the sleepiness was well marked for two weeks. At the second week a slight return of emesis obliged him to lessen the dose for a few days. In him, as in most young people, the constipation was readily overcome by a rhubarb pill at bed-time.

Miss C., æt. 52, has had, for a year, attacks of violent pain, which are referred to the pit of the stomach, or rarely lower. They had no relation to her meals, but were easily brought on by fatigue. The natural ending of these spells seemed to be in slight emesis, and for a long time the very least vomiting gave instant relief, which, however, ceased to be the case after a year, when the attacks had become as frequent as two to four a week. The most careful search discovered no gall-stones in the stools, and only once was there bile in the urine. The matter vomited was rarely the food, but only thin mucus, not acid, and containing no sarcinæ or other substance which cast any light on the case. Alkalies, tonics—for she was very pale and feeble—stimulants, acids, pepsin, arsenic and bismuth were used in vain. Hypodermic injections and opiates internally alike failed. In this therapeutic despair—even change of air having produced no good result—I advised the use of the milk-treatment; and, as her case illustrates alike the value and the difficulties of this plan of diet, I conceive it to be very instructive.

At this time her attacks were of almost daily occurrence. The milk was given cautiously—a tablespoonful every two hours—for two days, when it was doubled. On the fourth day she took four tablespoonfuls at each dose, and at the same intervals, but was manifestly not losing weight, although weak. A little whiskey added thrice a day bridged over this trouble, and was abandoned on the seventh day. Up to this time she had no attack, nor had she any up to the beginning of the fourth week, when the milk was given up. The reason for this was twofold. Her disgust at the diet was unconquerable; nor was I able by slight changes to secure continued good results. More complete alteration of diet brought back the attacks. I yet believe that these difficulties might have been overcome; but in her the milk caused a constipation so utterly invincible that not even the most powerful purgatives or enemata were of any avail. Needless to say that, with the promise of so much good from milk, no means was left unused to enable her to take it, but all alike failed us, and

I was forced, in this case, to confess myself beaten. Mechanical means were finally needed every few days to break up the tough rectal accumulations, and so the milk was given up. Her case was probably gastrodynia.

Somewhat like it, in certain respects, was the history of a man who was sent to me from Elkton, Maryland, by my friend Dr. Ellis :

About nine months before I saw him he began to have increasingly severe attacks of pain, which came on an hour or two after meals and lasted nearly up to the next meal. The pain was sharp, and was referred to the epigastric region and to the left side below the ribs. There was a good deal of wind, occasional acid stomach, and no tenderness anywhere ; bowels regular, urine high-colored, but free from albumen and depositing urates abundantly. He had been skillfully treated with a variety of drugs, but with no relief. On explaining to him the milk diet, he professed himself able to carry it out. About two months later he returned to show himself, when I learned that he had lived on milk alone during the whole of this time, with immediate, enduring, and absolute relief from all his pains. He was then directed how to return to his usual diet. Several months afterward I learned that he was still living partly on milk, and was well and vigorous.

Mrs. B., widow, æt. 33, had for years suffered from constant acid dyspepsia, for which she had been treated by several physicians, both at home and abroad. Her only relief consisted in the most careful choice of a minimum amount of food, and in the constant use of bismuth. She weighed 118 pounds, and was sallow and disfigured by an eczematous eruption.

During the first day of the milk-cure she took only one tablespoonful every two hours, and after this it was increased as I have described. In a week she was taking a little under a quart daily, and her weight was down to 114 pounds. A little whiskey was now added, and left off at the fifteenth day, when she was taking over two quarts of milk. The weight continued nearly steady up to the end of the third week, when she declared that even the perfect ease attained as early as the third day of the treatment was scarcely a compensation for the horrors of this exclusive diet. A little persuasion, however, enabled me to continue its use another week, when I began to give stale bread, and in a few days later venison. Her gain in weight from this time was strangely rapid, and five and a half weeks after we began the milk brought her up to 129 pounds, with a perfectly clear and spotless skin. The aloes pill and enema answered throughout to control her bowels.

It is now nearly a year since this time, but despite her final abandonment of milk, she retains alike her good looks and comfort in digestion, having had in this time only one relapse, which yielded to a brief return to the diet.

The above cases, selected for various reasons, are merely representative of difficulties or successes, and it would be quite possible for me to multiply either class. Suffice it to say, that in old and unmanageable cases of dyspepsia, and in neuralgic disorders related to the gastro-intestinal viscera, the treatment by milk has been sometimes a reliable resource when without it I must have been in therapeutic despair.—*The Medical Times.*

NECROSIS FROM SKATING.

Prof. Moses Gunn, of Rush Medical College, Chicago, Ill., (*Chicago Med. Journal*), recently exhibited four cases of necrosis of the tibia, occurring in boys and young men. One case was remarkable chiefly on account of the large extent of superficial ulceration as compared with the small amount of bone disease. Again, another fact worthy of remark was, that they were so often caused by skating. A young man skates for several hours on a very cold day, comes home chilled through, and goes through the familiar history of necrosis. All of the above cases were young men and boys, and three out of four contracted the disease by skating.

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THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

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The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical peculiarities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND MICROSCOPIC ANATOMY.

The lectures from this chair will include a consideration of the entire subject of human physiology and physiological chemistry, with such portions of comparative physiology as are essential to a comprehensive understanding of the subject; also, the doctrines of life and organization. They will be amply illustrated by appropriate chemical experiments and vivisections.

The minute structure of the organs involved in the organic and animal functions will be carefully described and illustrated by diagrams and the class microscope.

ANATOMY AND SURGERY.

The instruction in this department will embrace a systematic course of Lectures on Descriptive and Surgical Anatomy, fully illustrated by dissections on the *cadaver*, preparations, models, drawings, &c.

The minute anatomy of the various organs and tissues of the body will be shown by the class microscope, and particular attention will be given to the demonstration of the anatomy of the head and face.

Clinical instruction in the diagnosis and treatment of the surgical diseases of the mouth will be given once a week by the incumbent of the chair. Students will thus have the opportunity of studying oral diseases, and witnessing the operations adopted in their treatment.

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In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the demonstrators.

IN THE OPERATIVE DEPARTMENT.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

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The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

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are met together to perform. Each anniversary, we lead us one and all to ask the question—have my hours been consecrated to anything above self? Have the moments ever been hallowed, by a crucifixion of lower aims and ambitions, to a single hearted devotedness to the education of those not possessing my advantages, to the elucidation and formation of new ideas and more convenient appliances; *in a word*, to the elevation of my colleagues? Have I, in the past, trustfully, hopefully and energetically, worked for the common weal, that in the end my life may not have been in vain? Who can answer these questions affirmatively? I fear *not one*; but in so far as we approach to it, in so much as we have

succeeded in attaining it, just so near are we to that self-sustaining power that is so necessary to the building up of a truly great professional life.

I welcome you to-day to these halls, not as students, not as probationers, waiting with anxiety for a knowledge of the fate that may be in store for you; but as fellow practitioners, traveling the same road, possessed with the same desires, imbued with the same aspirations and aiming at the same degree of perfection as myself. As colleagues of an honorable profession we come together to give the right hand of friendship to each other, to renew the olden time, when hand in hand we received the seed of information which has in so many instances borne the richest fruitage. We come together as brothers, and in the fraternal greeting we recognize the fact, just adverted to, that the years glide on, but in the gliding, the seams and marks of the silent traveler are plainly visible. All this is well. The advanced line of battle should always be held by the veterans of many a crusade, against the legions of ignorance, and as they depart, younger soldiers take up the position. So, ever advancing, the field can never be wholly lost. I welcome you all, from whatever clime you may have come, and trust that in the end you will feel that it has been good that you have left for a brief season your professional labors, and have gathered around your *alma mater* to welcome and be welcomed. To my mind, there is no question more legitimate to the duties of this meeting than, "What contributes most to professional power?" It is a question that each and all must analyse, and, if possible, endeavor to reach a solution. We all profess, or should profess to believe, that knowledge is power, or, in other terms, that he wields the greatest force in the world whose education has been the most perfect. While this is true, and almost axiomatic in its truthfulness, the modes to be adopted, the means to subserve the great end in view, are by no means so clearly defined. In no branch of human training have we cleared a path entirely free of difficulties, and we cannot claim an exception in favor of our own profession. Young in years, still encumbered with crude ideas, inseparable from this period of experience, we have largely developed in our professional brain an overweening self-consciousness that we have accomplished very much for our boyish age. But the boy is growing into the man. As the garments are being changed for adult life, there comes the knowledge that the limit of our information is circumscribed to a degree that borders on the ridiculous. Time is fast verging into the half century since the profession of dentistry may be said to have been born. It had a life long anterior to this, but it was crude, misshapen, simple in its aims and narrow in its cultivation. Slowly the child has matured, yet rapidly, when the difficulties that have surrounded this growth are taken into consideration. The stepping stones in its history are

plainly marked and can be read by all. We see the progress, but we cannot realize the difficulties that have environed each step; the hours of anxiety, of hard labor, of deep study, that have formed out of chaos the beautiful structure we now behold.

The lesson of the past is full of significance, is replete with instruction, and affords a basis for future speculation and growth. Nineteen years have passed into oblivion since this college was organized under the name of the Philadelphia College of Dentistry! Since then circumstances have rendered a change of title necessary, but it is the same in all respects, except such as time would bring. The alumni of the old are recognized as those of the new, and must ever be recognized as one brotherhood, with common aims and aspirations. Each year since that period of organization, has there been an incoming and outgoing of a class of young men, eager to be instructed in all that appertained to their profession. Each year has added to the sum of intelligent workers. The good results were not immediately manifest, and many were ready to point to the fact that but few graduates took high positions, as an argument that dental colleges were a failure; *forgetting* that years must elapse before the young fledgling could take an independent flight. But that argument has ceased to have force. The graduates of the past are taking the lead. Our associations, national and local, are principally managed by these, and it is to their influence for good that we see, to-day, that intense eagerness to be classed with those who have earned their degree.

When I recall the early days of dental education and compare them with those of the present, I feel that progress has truly marked our career. When I remember the names of a Harris, a Wildman, an Arthur, a Maynard, in the great work of regeneration, the question, "What contributes most to professional power?" is answered, and it might be given in one word, *education*. These men, as well as a host of others, have builded that others might reap, have given of their intellectual force that you and I are enabled to perform works worthy of our generation. But, if we profit not by their example, we will have no future worth the record.

I do not belong to that class of mind that stands ever ready to ignore the past and the benefits derived from it; but it is the ever living present we now have to deal with, and the needs of that near future that will hold us accountable if we fail to do the work of the hour. Are we, then, performing our whole duty? This each must answer for himself, but to my mind there are many things yet to be done, and it is the purpose of this brief address to point out some of these.

When medical and dental colleges were organized in this country, the importance of a thorough preliminary education was felt and considered;

but owing to the peculiar condition of the country, this could never be made an absolute requirement before entering a school. The country was new, it required professional men in large numbers to meet the wants of the different communities, and it was therefore left to the individual to judge of his own fitness to commence the career he had chosen. The result has been in many respects injurious. We see it painfully manifest in the medical profession, where the dead weight of ignorance cripples the energies of the more enlightened, and makes American medicine a by-word and reproach in Europe. In dentistry the same results in degree have been reached. In the earlier years, the strong, natural ingenuity and practical ability of our countrymen, enabled them to take a leading position. They accomplished miracles, and were and are the wonder of the world in this department; and because they have done this many are deceived into the belief that any further advance in education is of very little if any value. Here lies our great peril. Self-complacency has destroyed individuals, has sapped the life of nations, and ended in their total destruction. The result cannot be different with our profession. It is only by an humble appreciation of our great needs, of our fearful shortcomings, that we can hope still further to progress and keep in the vanguard of the advancing hosts. We have passed through the early period of our professional life. The cultivation of the mechanical details absorbed, and properly so, the minds of the best thinkers and workers in our midst. This was the great need. Without this, theory was valueless; indeed, without it the profession itself ran in danger of becoming a monster of malpractice. But we have given our years of best thought in this direction. We had almost perfected the mechanical branch when vulcanite, with its quacks, came as an avalanche upon us, threatening to overwhelm all that was good in this direction, and to destroy the labors of a half a century. How much injury this has accomplished is known to you all, and I need not dilate upon it. The operative branch has had its trials, its days of amalgams and plastic fillings, but the good sense and true faith of the many have so far stood as a wall of adamant against the insidious approaches of these fell destroyers. Over all these, operative dentistry has advanced with rapid strides, until it would seem that there can be but little left to wish for. We have learned to build our foundations well, and are no longer in doubt in regard to the result of the majority of our operations. Having, therefore, carried the two main branches of our profession to a point at which they can be left to that gradual growth and improvement that years will bring, are we not prepared for greater efforts in other departments?

The distinct propositions that I would then submit to your considerations are these:

1st. Is a preliminary examination necessary before entering the study of dentistry?

2d. Should the time of study be lengthened?

3d. Is it necessary to enlarge the knowledge of collateral branches?

4th. Are compulsory laws, requiring a grade of ability, expedient?

I am fully aware of the difficulties that meet me at the outset in the consideration of the first query. Some of these have been already adverted to; but in the consideration of a question, the difficulties to be encountered are not to be taken into account. Is the path to be pursued a proper one? This decided upon, there is but one course to pursue, and that an unswerving devotion to its attainment. It must be apparent to every reflecting observer, that no structure of any value can be reared upon an insecure foundation. As this is true in architecture, so is it equally true in mental culture. The man who begins to study at the top of the ladder finds himself, instead of advancing, to be ever, crab-like, crawling backward in the laborious effort to find the first round. That the labor is a discouraging one, needs no assertion to those who have tried it. Now, is not this the exact position of a large proportion of medical and dental students to-day, and especially of dental? This is not said with a view to discourage any laudable ambition. Far be it from me to do this. I would rather encourage every earnest effort to advance. While the profession was in its pupillage, this was not wholly detrimental; but now it is working a very great injury, indeed, is the drag that must land us in a wilderness of crudities, if a strong arm is not interposed to check it. Our colleges have done much, indeed, they have accomplished wonders, as is evidenced to your own comprehension, but they cannot do all. Now what are the facts? Men untrained in special studies, often with meagre education, enter our colleges and are met at the outstart with problems the most difficult, requiring a large amount of intellectual culture to comprehend, much more to master. They are overwhelmed at once. They are at the top and vainly essay to discover the beginning. The result is a constant floundering, through insurmountable difficulties until the end. Is it any wonder that men are turned out of colleges, good in practice it may be, and even passably good in theory, yet wholly unfitted to cope with that intellectual power, that is striding through all lands, and demands the fullest and completest attainment. There can be no remedy for this evil but a preliminary examination, thorough in its character and arbitrary in its demands. That this must come, whether this year or next, or a score of years hence, is certain, and only through its influence will we be relieved of the stigma of graduating uneducated men.

You can do much to help this sentiment in the profession. I am happy in the belief that the largest proportion of our graduates have been men

of sterling attainments ; but it is only through the accidents of life that this is so. Many more have not been of this character, a misfortune to them as well as to their alma mater. I speak plainly, for the hour requires plain thoughts.

The subject of education is receiving more attention than ever before. The fearful war, now devastating and making desolate the homes of two nations, has had one good result amidst the fearful physical and moral destruction it has brought about, and that is, that it has opened the eyes of the whole world to the power of an educated people. Already the national legislature is ringing with appeals to make our education a subject of governmental care, and our State is looking toward compelling every parent to send the child to school. Is it not, then, proper and meet that we, in convention assembled, should earnestly take into consideration what will best advance our grade of scholarship, and give an impetus to our professional work ? That it must be sooner or later done is plain to my mind, that it will be done is equally plain.

Should the time of study be lengthened ?

I presume the necessity of this needs no argument. It is evident that our colleges are all lapsing into weakness by catering to the current American idea of rapidity of acquirement. The whole system is one of cramming from beginning to end, and while much is learned it requires the constant after training of years to digest that which has been secured. Superficiality is the bane of American life in all departments, and yet even in this land the boy apprentice to a mechanical branch cannot enter the position of a journeyman under five years pupilage, and this, perhaps, simply to give manipulative dexterity, brain work being mainly left for superiors. The dentist, however, is expected to acquire his profession in two or at most three years, and to become to some extent cultivated in many collateral sciences. His first duty is to perfect himself in mechanical dentistry. This is a combination of several branches, and alone should have a close apprenticeship of four or five years. This study will embrace an amount of knowledge from the collateral sciences, that will fully occupy the time allotted ; but then we have operative dentistry also, that combines within its needs the skill of the artist, the knowledge of the anatomist, the coolness of the surgeon, and the keen insight into the causes and remote results of disease of the general practitioner. That this will require more time than is usually given must be conceded. Then if to these we add the necessary branches of study, anatomy, physiology, chemistry, materia medica, histology and surgery, the curriculum is beyond the management of any single individual in the time given. But these are not all. No dentist can be considered educated who lacks general information on all the sciences. He should have a clear idea of com-

parative, as well as general and special anatomy. If he is deficient in knowledge of the teeth of inferior animals, their general character and minute structure, how can he comprehend those he daily deals with? He cannot possibly. Yet how few there are who have any definite comprehension of the intimate relations existing between the structure of the teeth of all animal life. While it is the duty of the college to enter into this study, it can never be fully elaborated in the short time permitted the teacher. Thus I might analyse all the collateral sciences. Each in its turn may be made available for our purpose; if not directly, at least so far as to build up the whole man, and make a cultivated being fit to mingle with and take part with scientific men everywhere. When this is accomplished, then will dentistry receive the full meed of respect, and not until then.

That all this could be achieved in any ordinary pupilage I do not pretend to affirm. I am no advocate for very long periods of probation. I would prefer that an individual should receive the basis of an education and not the whole education; indeed, the latter can never be done. My own opinion is, that four years of college life would be the proper period, following a year of preparatory study in the laboratory. This would give five years of training, a time not too long to be burdensome to a young man willing to be thorough in every department. With such a course, the studies could be properly divided and the labors of the student condensed into digestible proportions. Are these utopian ideas? Not at all. They are fully carried out in Europe, where seven years are required for the study of medicine, following a most severe classical course, and this time is not spent in idleness. To each year is given a study; to one anatomy, another physiology, to another chemistry, and the end of the year must find the student competent to pass a severe examination in each to enable him to advance. At the end of his term he has another severe examination, covering the whole ground; and then a still severer one by the government, in which, if he fails, he is forever prevented from the practice of medicine. Is it any marvel that German science leads the world? If, therefore, we would ever aspire to an equal position, we must reform in this respect, and the sooner we comprehend the importance of this, in all its length and breadth, the more quickly will we be prepared to take measures for its accomplishment.

While in the adolescent period of our profession, immaturity of thought and a lack of attention to more theoretical branches could be overlooked, trusting to the future to cure the evils consequent upon it. Have we reached or are we nearing that future? It seems to me the answer must be clear to every mind that we have. Upon whom, then, devolves the work of regeneration? On you, most assuredly. To you belongs the

duty which became yours as part of that diploma, which you so earnestly worked for and so clearly earned. To mould the sentiment of a nation, to make a new path in the world of ideas, is the part of the profound, progressive thinker and worker, and marks the statesman above the mediocracy of his generation. Therefore, to us belongs the same duty, in a minor sense, towards the profession of which we are members. The work is one of magnitude, but difficulties to the morally courageous are but incentives to labor. The isolation of the graduate who settles in a remote section, surrounded by ignorant pretenders, may be imagined, but can hardly be realized. Shall we protect these? Shall the skill acquired by accurate training be wasted in vain endeavors to battle, single handed, this legion of ignorance? I trust not. The remedy, in part, lies at your doors. Organize everywhere in associations. Allow no man to enter who cannot show a diploma or submit to a thorough examination. Avail yourselves of your law makers, and secure the future if you cannot remedy the past. I am well aware that men of ordinarily good judgment are opposed to any legal force to remove this evil, and while, as a rule, I have more faith in the ultimate spread of intelligence, to arrest this wide spread quackery, I have still a belief that the innate depravity of man, or whatever you choose to call it, tempts him to continue in evil, unless superior forces lead into the path of good. At all events, we have the ripe experience of European nations to prove that such laws are of great value, if properly carried out. When a man knows there is but one road to reach the goal desired, he will set about to find that road; but if there be many, he will in all probability select that which seems the shortest, regardless of the many quagmires and obstructions he may meet with. This is human nature. Recognizing this, then, as a fact, our duty is plain. Laws of a stringent character must be passed, prospective and not retrospective. We cannot go back and say that every man in practice must submit to an examination; but we can say and must say, that no man in the future shall enter the practice of dentistry without a diploma from a regularly chartered college. This will not benefit *us* materially; but those of a half century hence will feel the full value of our exertions. You graduates of dental colleges can do this. On us this duty devolves, and woe be unto us if we are faithless to our mission.

There is still another duty devolving upon you. Support your dental colleges. See to it that they have that material aid that will enable them to carry their mission to its highest fulfillment. Give them the full weight of your moral support and sympathy. The difficulties, the anxieties, the severe labor that falls to the lot of the teachers in these, few know and still fewer appreciate.

There are many critics of instruction, but how few competent to instruct,

or if competent, are willing to sacrifice self for the good of others. That I believe colleges are imperfect you already know, and that they have performed a wonderful work for good cannot be denied. Give, then, the various Faculties your earnest support, and in the giving you will build still higher the temple dedicated to knowledge.

The hour in which we work is full of promise. Enlarged ideas of man's aims and destiny are taking the place of narrow bigoted views. The grand in human nature is overleaping the contracted selfishness of by-gone ages. Facts are recognized and mere theories discarded. Science, with her irrefutable logic, is scattering the twaddle of the past like chaff before the whirlwind. Men are becoming thinkers, and the more reason guides the helm, the more will the world advance. I congratulate you that in this hour of promise there is so much to be labored for. You know the path, follow it; and though you may not reach all that is desirable of attainment, the fact that your minds have wrought in the intellectual mine, and that you have labored to give the thoughts expression, will bring with it its own true reward. None of us may hope to be appreciated. The true worker never gives this a thought. The development of an idea is to him always self-sustaining. He can wait patiently for results, knowing that in the good time its truthfulness will be manifest. In the love, then, we bear our profession, by the hallowed memories of those who have past—by the interest of the living present, and the great needs of an unborn future, let us ever keep working, and the tiny seed will grow into the sapling and the sapling to the tree, and under its shadowy foliage we may end our years with the consciousness that we have not wholly lived and worked in vain.

THE GLYKOGENIC FUNCTION OF THE LIVER.

[Extracted from an Introductory Lecture to the Class of the Pennsylvania College of Dental Surgery, November 7th, 1870.]

BY JAMES TYSON, M. D., PROFESSOR OF PHYSIOLOGY AND MICROSCOPIC ANATOMY.

It has been customary to arrange the *phenomena of healthy life*, the consideration of which is the object of the science of Physiology, into two grand divisions, the functions or phenomena of *organic* life, and those of *animal* life, or the functions of relation. The former are common to all animals and vegetables, being those by which simple vegetative existence is maintained; while the latter, or animal functions, are peculiar and confined to animals, being the phenomena by which all but the lowest forms are distinguished from vegetables.

The *organic* functions include *Generation*, or the function by which the individual is reproduced, and the species preserved; *Digestion*, or the process of the preparation of food; *Absorption* and *Sanguification*, by

which the prepared aliment is introduced into the vessels, and converted into blood; *Circulation*, the function by which the blood is distributed throughout the economy; *Respiration*, through which the blood is ærated or acted upon by oxygen, and relieved of its carbonic acid; *Nutrition*, a still imperfectly understood process in which new material is laid down in the place of the old, which, in turn, is taken up and carried to the sewers of the body; *Secretion*, a process allied to nutrition, in which certain fluids and solids are separated from the blood, either to be used again as milk, or to be thrown out as useless or harmful, as the ingredients of urine; and finally *Calorification*, through which the uniform heat of the individual is maintained.

The *Animal Functions* or functions of relation are *Sensation*, *Voluntary motion*, *Mental and Moral Manifestations*. *Moral* manifestations are peculiar to man, constituting the cardinal characteristic by which he is distinguished from the so-called brute creation, to which must be permitted *mental* manifestations, at least in their general significance. But through his moral manifestations, man is enabled to conceive the Good, the True, and the Beautiful, and to comprehend also, the existence of a Supreme Being. These are conceptions of a highest intelligence, and by these man signalises himself rather than by a more perfect physical organization.

In all systematic treatises on Physiology, it is customary to take up these several functions, and consider them in detail; and such, indeed, will be the general method in this course of lectures. But so vast has become the amount of material at the disposal of the physiologist, that it would be quite impossible to state even all well-determined facts in the limited time allotted to lectures in the American system of medical education. So that a deviation from a strict observance of such a plan has become necessary in recent times, as the result of which it is found best to omit any effort at including all known facts of physiological science, but to confine ourselves to the demonstration of crucial matters; while it is attempted, also, to indicate to students the paths by which they can at once complete their information upon known points, and at the same time extend the boundaries of a science, the most fertile in unexplored treasures. To do this, we must seek a practical familiarity with the means which contribute most to this end.

The agents which have added most largely to our knowledge of physiological science are the *microscope* and *experiment*. The use of the former has been sufficiently illustrated in the preliminary lectures which I have given you in the past five weeks. I will not, therefore, occupy your time with any further consideration of it. But some of the results of the latter, I propose to illustrate in the course of the present hour.

For this purpose I have selected the *glykogenic* or sugar-forming function of the liver, which I hope to be able to demonstrate to your satisfaction.

In 1848, Claude Bernard, while seeking for the place in the body where the sugar derived from alimentary substances disappears, discovered sugar in the blood of the hepatic veins of dogs which had been fed for seven days exclusively on meat, and confirmed his results by repeated experiments. Thence he concluded, that sugar was formed in the liver, and was contained in the blood coming from that organ, independently of the diet of the animal. He also made extracts of the organ itself, and found it always contained sugar, while the other tissues of the economy were entirely devoid of it. Subsequently, he found it in the livers of nearly all animals, including man.

That sugar is not only present, but produced for some time after death in the dead liver is easily demonstrated. I have upon this plate a portion of dog's liver removed two days ago. It is therefore preëminently dead liver. Taking a part and rinsing it in cold water I cut it into smaller pieces, conveniently with a pair of sharp scissors, allowing the fragments to fall into this capsule of boiling water, to which an excess of crystallized sulphate of soda is added. After allowing the mixture to boil for two or three minutes the whole is poured into a mortar, compressed with the pestle, and then thrown upon an ordinary filter. The object of the sulphate of soda is to clarify the extract. The same thing is accomplished, though with more time and trouble, by filtering through animal charcoal. The filtrate is then a clarified aqueous extract of liver which is supposed to contain sugar. On cooling, abundant crystals of sulphate of soda deposit upon the sides and bottom of the vessel, but these do not interfere with the test. To determine the presence of sugar, I add, to a portion of this solution in a test-tube, a few drops of Fehling's* solution, a modified

*The following are the proportions to be used in making Fehling's Solution, taken from p. 147 of Dr. Roberts' "Urinary and Renal Diseases:"

40	grammes crystals of sulphate of copper,
160	" neutral tartrate of potash,
750	" caustic soda, sp. gr. 1.12.

Add water up to 1154.5 cub. centimetres.

Ten cub. c. correspond to 0.05 gramme of grape sugar.

It is well known that Fehling's Solution is liable to change on standing, so that if boiled, a precipitate takes place, even though no sugar is present. To obviate this risk, Dr. Flint prefers to make three separate solutions, which are to be mixed just before using, as follows—(Flint, Physiology of Man, Vol. III, p. 301:)

Solution of crystallized sulphate of copper, 90½ grs. in a fluid ounce distilled water.

Solution neutral tartrate potash, 364 grs. in a fluid ounce distilled water.

Solution caustic soda, specific gravity 1.12.

Take half a fluid drachm of the copper solution, add half a fluid drachm of the solution of tartrate of potash, and add enough solution of caustic soda to make three fluid drachms. Two hundred grains of this solution accurately made are exactly decomposed by one grain of sugar.

Trommer's test, and apply heat. Almost immediately after the boiling process begins, you note the reduction of the oxide of copper and the precipitation of the red suboxide.

This liver, then, undoubtedly contains sugar. Nor is this alone true. If a stream of water is passed through the portal vein, it will wash out the sugar there present, and if a piece of the organ be thus extracted and tested in the way I have shown you, it would not respond to the copper test. But if it be allowed to remain a few hours at rest, and then again tested, sugar will be found present, showing not only the presence of sugar in the liver, but that it is *produced* in this organ after death.

To prove, however, that the liver is a sugar-forming organ during life, something further is necessary; and Bernard further established the two following propositions, which I will also attempt to demonstrate: first, that no sugar is found in the blood of the portal vein of animals fed upon nitrogenous or non-saccharine and non-amylaceous articles; second, that sugar is found in the blood of the hepatic vein of these same animals.

In this test-tube I have an extract of the blood from the portal vein of the dog whose liver I have just tested, and which I prepared in a similar manner. Let us apply the Fehling's test. You note that the boiling point is attained, and that the process is continued for several minutes, and yet no reduction takes place. There is, therefore, no sugar in this extract of the portal blood. In the second tube, I have an aqueous extract of the blood taken from the hepatic vein of the dog whose portal blood we have just tested. I apply the same test, and you note the reduction which takes place of the protoxide of copper. Not nearly so marked, it is true, as when applied to the extract of the dead liver, but sufficiently so to satisfy us of the presence of sugar in this situation,—that is, in the blood coming from the liver.

Thus would appear to have been demonstrated the sugar-forming function of the liver. But the faith of many physiologists was for a time shaken by the results of the experiments of Schiff, Meissner, and Jaeger, of Germany, and especially of Pavy, of London, whose experiments were repeated with like results by M'Donnell, of Dublin. These experimenters declared that the liver did not actually contain sugar during life, but that the production of sugar was post mortem; that the liver produced, during life, the sugar-forming substance called by Bernard *glykogen* or *zoamyline*, but that the transformation of this substance into sugar did not take place in the living state, but after death.

These objections seemed at first well founded, for it can readily be shown that the living liver does not contain sugar. The dog which I now introduce has had nothing to eat for several hours. I propose removing in your presence, a piece of the liver, which shall be as nearly as possible

in the condition of the living organ, and without the administration of an anæsthetic, the use of which is attended by the appearance of sugar in the general circulation. The usual plan is to break up the medulla oblongata, but I propose here to administer prussic acid. A few drops of the strong acid are placed upon the animal's tongue, and in a few seconds, though not actually dead, he is beyond all suffering. Opening the abdomen and thorax quickly, the heart is seen to be still beating, the lungs expanding and collapsing. A piece of liver is rapidly cut out, rinsed in cold water, cut into small pieces in the capsule of boiling water, and treated as was the piece of the dead organ. The test liquid is applied, and you notice there is no response. The living liver therefore contains no sugar. What then is the state of the case? Does this prove that the liver is not a sugar-forming organ? Physiologists are, without doubt, indebted to Prof. Austin Flint, Jr., of New York, for the solution.

In September, 1869, Dr. Flint published a paper entitled "Experiments undertaken to reconcile some Discordant Observations upon the Glykogenic Function of the Liver," as the result of which he concluded that sugar is constantly formed in the liver but is discharged into or washed out by the blood of the hepatic veins. In an experiment performed before the class of the Bellevue Hospital Medical College by Prof. Flint, January 4th, 1869, upon a medium sized dog in full digestion of meat, the medulla oblongata was broken up; the portal vein was tied through a small opening in the abdomen, the abdomen then widely opened, a portion of the liver excised, rapidly rinsed and cut up in boiling water—the length of time between the breaking up of the medulla and cutting up the liver being one minute. The vena cava was then tied above the renal veins, the chest opened, and the cava again tied above the hepatic vein. Blood was then taken from the hepatic veins, an equal bulk of water added, with an excess of crystallized sulphate of soda, and the mixture boiled. A portion of the portal blood and the decoction of the liver were then treated in the same way, and the three specimens filtered. The clear extracts were then tested with Fehling's liquid, with the following result: There was no sugar in the portal blood, none in the extract of the liver. There was a *marked reaction in the extract of the blood from the hepatic veins*, the precipitate rendering the whole solution bright yellow and entirely opaque.

Our experiments to-day have sufficiently confirmed these results, and though they would seem amply conclusive, Dr. Pavy replied to Dr. Flint, "that so quickly is sugar formed in the liver after death that the result was to have been expected, considering the expenditure of time involved in applying the ligatures." This objection can, of course, only refer to the presence of sugar in the hepatic vein, since the results of Dr. Flint's

experiments, as well as the one performed before you to-day, coincide with those of Pavy as to the absence of sugar in the living organ.

We believe the question to have been definitely settled by the recent experiments of Prof. W. T. Lusk, of New York City, whose paper "On the Origin of Diabetes" is contained in the New York Medical Journal, for July, 1870. Dr. Lusk's experiments consisted *first*, in the removal of blood by catheterization from the right side of the heart, and from the jugular vein; *second*, in testing with a carefully diluted Fehling's solution the alcoholic extracts of these bloods. The results clearly showed that the quantity of sugar in the right side of the heart was two to four times greater than that found under corresponding circumstances in the jugular vein, and from this he justly concluded that there was by no means an insignificant amount of sugar in the pure hepatic blood, before it has become largely diluted with the comparatively non-saccharine fluids of the venæ cavæ, and thence that the liver "is certainly, under normal conditions, the principal source of sugar in the economy."

These observations, then, would lead us to accept the conclusions of Prof. Flint, Jr., as apparently confirmed by the demonstrations of this lecture, but especially by the crucial experiments of Dr. Lusk. Our own conclusions are, then, those of Prof. Flint, which we accordingly append from p. 315 of his third volume, that including "Secretion, Nutrition, Movements."

1. "A substance exists in the healthy liver which is capable of being converted into sugar; and inasmuch as this is formed into sugar during life, the sugar being washed away by the blood passing through the liver, it is perfectly proper to call it glykogenic or sugar-forming matter.

2. "The liver has a glykogenic function, which consists in the constant formation of sugar out of the glykogenic matter, this being carried away by the blood of the hepatic veins, which always contain sugar in a certain proportion. This takes place in the carnivora as well as in those animals that take sugar and starch as food; and it is essentially independent of the kind of food taken.

3. "During life the liver contains only the glykogenic matter and no sugar, because the great mass of blood which is constantly passing through this organ washes out the sugar as fast as it is formed; but after death, or when the circulation is interfered with, the transformation of glykogenic matter into sugar goes on; the sugar can then be detected in the substance of the liver."

It should also be stated, that the animal from whose portal and hepatic blood were made the extracts used in this lecture, was placed under the influence of an anæsthetic, the objection to the use of which has been

alluded to. But since the comparison was made between the portal blood going *to* the liver, (which alone could obtain sugar, on the supposition that nitrogenous food only is used, from the systemic blood through the coeliac axis and superior mesenteric artery,) and between the same blood passing *from* the liver, and since the former was found *not* to contain sugar, we do not think any valid objection can be made to the use of ether. In analyses of blood obtained from the cavities of the heart, the omission of the anæsthetic is more essential.

FUSIBLE ALLOYS.

BY JAMES LEWIS, D. D. S.

The field of fusible alloys is a large one, and undoubtedly there is much yet to be developed in it to serve purposes of utility in directions as yet not contemplated. So far as relates to the requirements of the dental profession, it does not seem to me that we can hope for a very decided increase of advantages by making extended experiments for the purpose of perfecting alloys fusible at a low temperature, to be used as bases for artificial dentures.

Tin forms the principal ingredient in all the compounds now in use for the purpose under consideration. By itself, this metal lacks several important requisites, the partial attainment of which suggests the addition of other metals. There are several metals that may be combined with tin to increase its hardness, and in a very slight degree its elasticity—two essential qualities in which tin alone is wanting. In my experiments, having in view an alloy for bases for teeth, I have been restricted to the use of a limited number of metals. Lead can scarcely be permitted in the mouth on account of the poisonous nature of its salts, and the readiness with which they might be expected to be formed when an alloy containing that metal is placed in contact with vitiated secretions in the human mouth. The same objection may measurably be urged with regard to antimony, copper and mercury, all of which metals are sometimes used in the formation of alloys in which certain modifications are required, some of which might be desirable in fabricating dentures, if the objectionable qualities incident to those metals could be overcome. My experiments, for reasons that are suggested above, have been confined to alloys embracing tin, cadmium, zinc and bismuth. I have noted some peculiarities in the compounds I have formed, most of which indicate negative results. In other words, I find more to find fault with than to commend. I find that tin alloyed with more than two per cent. of bismuth becomes

objectionably brittle. No modifications of any compound of tin and bismuth, containing more than two per cent. of the latter metal, is susceptible of any important improvement as regards brittleness by the addition of unobjectionable quantities of zinc or cadmium. With two per cent. of bismuth added, the hardness of the tin is not sufficiently increased to indicate the least advantage in using bismuth as a constituent of an alloy for "bases."

With zinc a greater percentage may be employed before we arrive at the point at which brittleness becomes a conspicuous feature. Ere this point is reached, however, other conditions are developed which are decidedly objectionable. In cooling, the alloy crystallizes in somewhat coarse granular crystals, which display themselves conspicuously on the surface of the alloy. When the quantity of zinc is not very great a slight modification of the tendency to crystallize in large crystals is effected by the addition of cadmium. Still, while the alloy possesses the requisite qualities of hardness and freedom from brittleness, the process of crystallization inevitably tends to produce an uneven surface in some places, marked by pits, in consequence of the shrinkage of the compound in cooling. Thus far I have seen no alloy free from this objectionable feature. Nor have I seen any alloy possessing sufficient *elasticity* to permit the construction of bases in which that quality might be desirable. But in cases where weight and stiffness are allowable, we may consider the fusible alloys, or at least the least objectionable of them, advantageous and not undeserving of our attention.

A specimen of a popular alloy that recently came into my hands has a peculiarity of surface, such as I have noticed only in *amalgams* formed by heat. I submitted small samples of this alloy to a few comparative tests with similar samples of alloys I had made while prosecuting experiments. I found that in contact with silver it gave a stronger indication of galvanic action, when in contact with the tongue, than samples of my own alloys, in which the percentage of zinc was near the maximum without producing brittleness.

Experiments with reference to the effect of the introduction of mercury satisfied me that the addition of this metal may be made with marked improvement in the *appearance* of an alloy without detriment to its hardness and tenacity. Not having tested the alloy alluded to for mercury, I have at present only a *suspicion* that mercury is one of its constituents.

Whether the addition of so much mercury as would improve the physical properties of an alloy would form a compound that would prove deleterious in the mouth I am as yet not prepared to say. On the other hand,

I am, like most of the profession, just enough prejudiced against an unnecessary use of mercury in the human mouth to feel unwilling to fabricate an alloy containing it to be used as a base for dentures.

While I disclaim any design of creating a suspicion in the minds of the profession as to the properties of the materials they use, I would be glad to have the subject fully investigated as to the utility or advisability of employing mercury in the fabrication of such alloys as are desired by the dentist. We know that fusible alloys, in which mercury is an element, have been urged upon the profession as suitable materials for plugs. I have no doubt such alloys may be used with as much safety as amalgams, against which a majority of the profession have a prejudice, based upon very legitimate but not invariably correct reasoning.

In the preparation of alloys, as in the fabrication of rubber compounds, the experimenter must necessarily be limited by the capabilities of the materials he uses, beyond which he cannot go. In the attainment of some one apparently desirable quality there must be sometimes a sacrifice of some other desirable quality, and as a matter of unavoidable *necessity*, perfection can only be approximated, even distantly.

While prosecuting some of my experiments with alloys, it occurred to me that in all probability the union of metals in *atomic proportions*, or in multiples thereof, might possibly produce better results than if no attention were paid to the "combining weights." I do not feel assured, however, that I have detected any advantages in this treatment.

Without entering into details or calling attention to experiments I have made, I may invite attention to certain facts which possibly may explain a suggestion I embodied in my remarks upon the *capabilities* of materials. It will be seen that the *qualities* sought in the proposed alloys for "bases" are hardness, elasticity, toughness, purity of color, and freedom from chemical action. None of the individual metals that we can use in the fabrication of the desired alloys have more than one or two of these qualities. One of those, elasticity, is not a characteristic of any of the available metals that can be used. Nor can it be secured by any combination of two or more of them. We have, then, to content ourselves with a *moderate* degree of hardness, a *moderate* degree of toughness, a marked degree of inelasticity, and only a delusive hope of freedom from chemical action. I confess my inability to offer any very valuable suggestions which will increase the sum of our *useful* knowledge of fusible alloys for artificial dentures.

MINUTE STRUCTURE OF AN AMALGAM-FILLED TOOTH.

BY S. P. CUTLER, M. D., D. D. S.

This tooth, lower second left bicuspid, decayed on posterior approximal surface, and extending over half of grinding surface, but not quite reaching the nerve, had been filled six months, and had given no trouble until a short time ago, when it became painful and somewhat elongated—pain experienced on occlusion of jaws for the twenty-four hours previous to its removal. The tooth never gave any trouble until a few days before extraction. The young man is about twenty-one years old, of nervous temperament, a clerk in a store. The fang of the tooth, about half way up from apex, presented that peculiar hyaline, or translucent appearance, usually witnessed in old age and in loose teeth, showing, more or less, closing of tubuli, and, more or less, secondary ossification of pulp cavity. It also had a long fang, rather crooked, firm in socket; none of the teeth missing on that side, though many of them were filled with gold and one molar with amalgam. This last at first was supposed to be the offender. The filling was removed, which gave entire relief to that tooth, but soon the pain reappeared with renewed energy in the tooth under consideration. On splitting open the tooth the crown portion of the nerve was found to be in a suppurating condition of recent origin, extending into the neck. The balance was only inflamed.

MICROSCOPIC APPEARANCES.

A central longitudinal section gave the following appearances: On the side of pulp cavity, occupied by the plug, secondary dentine had progressed inwards and downwards to a considerable extent as far as the alveolus, becoming gradually narrower, and finally ceasing by gradual taper to the opposite side of normal cavity—the secondary formation passing more than half around the cavity. The dentine over this region, up to decayed surface, translucent, similar to fang, with the usual characteristic change in tubular structure, though not so marked. The balance of crown normal, only the surface of decay which was not entirely removed in excavating, though no signs of decay going on. For a short distance, so far as the discolored *dentine* extends, there is the usual characteristic beccated or beaded appearance in tubuli, not caused by reason of mercury, as that is a common appearance of decayed dentine. I could discover no signs of mercury in tubuli whatever, or any original defects in the dentine. The pulp cavity of fang, to the extent of secondary change, as mentioned above, presented the usual secondary dentification from apex up to about the middle. On all sides about equally narrowing the canal, showing the peculiar irregularities of secondary dentinal tubuli, so often referred to in my former articles. The cement on one side of the fang was hyper-

trophied up to the middle, or as far as the change in the primary dentine and secondary limits. The usual bone structures of the cement somewhat changed the canaliculi, being less distinctly marked. My object in writing this article is to show the effects of filling where the decay is extensive and nerve nearly exposed and sensitive. This tooth had the white form of decay, as I was informed by the operator who filled it. Under the filling, the tooth cavity was dark and firm, the amalgam filling also being dark but sound; dark from oxidation, no doubt. There was a portion of the white softened dentine left intentionally over the nerve as a protection, or rather to avoid exposure of nerve from too much excavating. The oxidizing of the amalgam, no doubt, caused the darkened appearance of the dentine, and arrested any tendency to further decay from therapeutic influence. I examined closely to see if there was any traces of quicksilver in the tubuli or surface of decay or nerve cavity, but failed to find any.

Now, the question is this: is it possible, even where the pulp is dead, for the vapor of quicksilver to enter the minute tubuli by force or *osmose* action, or any other way, as there seems to be no adhesive affinity between the mercury and dentine to allow of what is termed *welting*? This is governed by certain affinities, that is, if the adhesive attraction between a liquid and solid exceeds one-half the cohesive attraction of the liquid, then *welting* takes place, otherwise not. Now, mercury and gold, silver and tin, possess this property, and if the tooth was composed of similar materials the mercury would readily pass into and through the tubes, if open; but there being no such affinity, no mercury could be found in dentinal tubes. Water will readily enter dentinal tubes, as the requisite affinities there exist. These fine capillary tubes may be supposed to absorb on the same principle as *welting*. Mercury, glass, porcelain, and some of the metals possess no such affinities. Many other bodies might be also named. Mercury will even dissolve gold, silver, tin and other metals, and when this takes place the *affinity* goes still further than that of *welting*, and is explained in this way: When any solid body is dissolved in a liquid, or forms a solution, the adhesive affinity between the solid and liquid exceeds the entire affinity of cohesion of the fluid atoms. What are the facts in relation to the tooth under consideration? This tooth had lost a large portion of its crown by decay, which was restored by an amalgam filling. This being a foreign body to the tooth, imparted its shocks through its conducting power, which being abnormal to the tooth, caused disturbance to its myriad of nerve fibrils, weakening their powers of vital resistance by slow degrees. As the vital resistance ebbs, the mineral encroachments march on apace, that is, as the vital integrity lowers, the circulation in the part

becomes lessened or stagnated. In consequence, there would be more time allowed for the mineral salts, as lime, to infiltrate into the now enfeebled tissues, and there remain a sufficient time to permit absorption to take place. In this way a nucleus is formed in the pulp substance, which serves, in turn, to attract more atoms around it and continues to grow, similar to the formation around the teeth, forming nodular dentine. But in the above case I found no nodules in the pulp, as I might have expected; on the contrary, I found precisely the same state of things that always takes place in old age, though in a much more hurried manner. In the one case, perhaps, an effect, and in the other, a cause, of lessened vital resistance. This effect, reacting and serving equally as a cause in both cases, bringing about the same results. This, though not yet a settled fact, may answer us as hypothesis, and may ultimately prove a correct theory. In the case cited above, there was of necessity great destruction of nerve fibrils, from the extent of decay lessening the sum total of vital resistance, at least throughout the substantia eburnia, or dentine, allowing the growth inwards in tubes and pulp cavity as already given above. Why the same effect did not take place throughout the entire tooth is not so easily accounted for, as this same partiality is recognizable in all similar cases from whatever cause. Even the changed dentine is not uniform in its character, the portions unchanged always presenting the usual normal appearance, only more yellow in advanced age. In all such cases the tubes are narrowed, more or less, throughout, as well as the entire pulp cavity. At what precise time this process commenced in the above tooth is not easy to determine. It may or may not have commenced before filling, though, from the numerous observations I have made in teeth similarly decayed, I am led to believe the change took place after filling. How much depended on the influence of the mercury I cannot say, neither can I say that gold would have done any better, or even tin; each might be governed by relative conducting powers. Whether the battery influence of the amalgam had any agency in the process, must be decided by more extended observation. It is possible that some non-conducting substance, such as gutta percha, or Hill's stopping, used as a filling, or as a capping under a metallic filling, would offer greater protection to the beleaguered pulp beneath. Os artificial is a non-conductor, but on first application is irritating, from the action of the hydrochloric acid on the lime of the tooth. The greater affinity of the acid for the lime, than for the zinc, decomposes a superficial layer, and in consequence renders that layer chalky. This becomes manifest through the enamel when in contact with it. This I propose to remedy by first introducing styptic colloid into the cavity on cotton and letting it remain a few moments, then remove the cotton, and by the

time the os artificial can be introduced into the tooth the ether is evaporated, leaving an impervious coating which the acid has no power to act on, in this way permanently protecting the lime of the tooth. Non-conductors also have their objections, as in the case of rubber plates. In gaining one point we may lose another, so that we have much to learn yet on the subject of fillings in large cavities. Os artificial, like every new lion in the arena, needs taming before it can be regarded as perfectly harmless under all circumstances.

In the above case there might have still been a chance for healthy action in the process of secondary dentification, could the process have been conducted a little slower, so as to have allowed sufficient time for pulp absorption, so that it could have been removed out of the way in time, and not have been too much crowded in among delicate nerve fibrils, causing inflammation and its consequences as above named.

The other day I extracted a molar for a young man which was decayed nearly to the nerve and aching. On splitting it open I found the bulb, or pulp, nodular, and no signs of inflammation. The pulp had a white appearance, and was unusually dense and plump throughout. Where the nodules were not, it was evidently thoroughly saturated with lime salts, so much so as to prevent any undue distinction of vessels and consequent inflammation. This tooth ached from pressure of earthy matter among the nerve fibrils, though not of an acute character, as in cases of actual inflammation of pulp. In a short time the entire pulp must have become ossified and ultimately subsided into quietude. The investing pericementum was inflamed, which was another source of trouble. All such teeth possibly could be saved by proper treatment, by assisting nature a little in her difficulties. This is only one, out of a great many that I have examined that were in a similar condition, that I might mention. I am not aware that other writers have paid much attention to this condition of pulp but only the nodular condition. This saturation of lime salts I have been studying carefully for some time, with a view to restoring such teeth, when troublesome, to a healthy condition. This is in many cases practicable, where the patient is manageable, or willing to wait and endure for a time a little inconvenience. There may be skeptics on this question, as well as on all other unsettled points, but they are generally investigators and open to conviction. My ideas concerning the cause of this condition of pulp have been repeatedly given to the profession, but I will recapitulate a little. In the first place, there must be a weakening of vital resistance in the part before any such encroachments can occur. Then a stasis in the circulation takes place from want of capillary integrity of function; or, in other words, *defective pronounce-*

ment on their part, owing to neural or vital weakness, as the capillaries have a special function to perform. After stagnation in the vessels for some time, the lime salts begin to osmose into the extra vascular tissue, and thereby, desiccating or drying, they begin to thicken and ultimately harden into nodules, sometimes filling the entire pulp, as in the case cited above, and by their pressure forcing the blood-vessels to deplete themselves, and by pressure pain is produced.

In the treatment of such cases, in the first instance, we must restore vitality to the pulp, which may be done by local stimulants of various kinds, including galvanism. This may be readily applied. At the same time weak vegetable acids might be used on cotton sealed up in the cavity. The acid should not be strong enough to decompose the dentine. This may be alternated with carbolic acid, creasote and various other agents. The object of the acid treatment is to dissolve out the soft solid lime salts from pulp: vinegar will do for this purpose. These ideas are suggestive only, not being based on very extensive experience with such teeth in the mouth, but outside with favorable results. I have treated many teeth successfully where I believed this acidifying process was going on; I have one of the kind in my own mouth, which gave me trouble, though not decayed. We often see cases in young subjects, where the teeth are very much crowded and lapped, causing trouble from pressure one on the other sufficiently to cause nodulation.

We often cap and fill teeth where there is slight exposure, sometimes with success and at others with failure and subsequent death of pulp. Most of the successful cases, sooner or later, undergo ossification of cavity or pulp, or both, to a greater or less extent. Sometimes such cases, from hurried action, are lost, when they might be saved by filling.

The lime salts, previously mentioned, after saturating the pulp, more or less, from pressure, drives the blood slowly and gradually out of the tooth, the salts taking the place of the blood in the vessels as the blood leaves them, and the entire pulp becomes differentiated into secondary dentine. The nerve fibrils alone resist this process, and in some cases succumb under the extent of earthy influence and suffer more or less ossification, the pressure causing their absorption.

One very remarkable and noticeable feature in the pulp of an aching tooth, where it is saturated with the earthy salts, is a total want of all signs of inflammation in such pulp, even where only a portion is saturated, which has a chalky feel and appearance. This chalky appearance always precedes nodulation. When this is perfected, the noduli becomes translucent, and lose the white appearance. In a few exceptional cases the pulp remains perfectly white.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

Since the report in our last issue, the surgical clinics have been held each Wednesday, as announced, and a number of patients have presented themselves, illustrating in their cases the various forms of disease and injury discussed in the didactic course of lectures.

In order to secure the attendance of patients, and to maintain the interest in the clinics, it has been deemed advisable to continue them during the entire year, with the exception of the months of July and August. The resident Alumni, and the students and friends of the College, are invited to attend, and their active co-operation is solicited in the development of this important feature of the course. The interest manifested in the clinics by the students during the past session has clearly demonstrated their appreciation of them, and the advantage to be derived from their fullest development.

January 4th, 1871.

You will recognize, gentlemen, the young man before you to-day as the same who presented himself December 8th, 1870, suffering from an alveolar abscess. He comes to-day in order that you may note the results of the method of treatment adopted in his case, and also to terminate the necessary treatment by having extracted the roots of the second molar tooth of the lower jaw, which, you will remember, we designated as the remote cause in the production of the abscess. By reference to the notes of this case, you will find it recorded that the roots could not be extracted when he first presented himself, by reason of the fact that the inflammatory action had involved the parts so extensively as to produce closure of the jaws. This condition is removed by the subsidence of the inflammation, and the offending fangs can now be readily reached. Your attention is called to the condition of the bone at the point corresponding to the alveolus of the second molar. In passing the finger over the body of the bone, externally, there can be detected a marked prominence, which is due to a deposition of ossific matter, combined with a thickening of the periosteum around the opening made by the pus as it forced its way through the external wall of the alveolus. This ossific deposit, or callus, as it is technically called, was deposited at this point as the result of the inflammation excited in the periosteum, and in the bone itself to a certain extent, and corresponds, in all particulars, to that which is formed about the ends of fractured bones. In the course of time this deposit will be removed by absorption, and the bone will resume its normal shape. You will also observe that the cicatrix, resulting from the incision made in opening the abscess, is concealed from view; in making the incision,

this fact was taken into consideration, and the result is such as we desired. The roots of the tooth were extracted by a member of the class, and gave evidence of having been the seat of inflammatory action.

Another patient presents himself to-day in order that you may observe the progress made in his case, and the effect produced by the operation which was performed. At a recent clinic an operation was performed for the removal of a large portion of the left superior maxilla, which had been attacked by necrosis following the extraction of several teeth. The presence of the sequestrum maintained a constant discharge of pus, which, acting as a drain upon the system, had materially impaired his general health. Soon after the removal of the dead bone the discharge ceased, with the exception of a very slight quantity, which came from a point near to the opening between the cavity of the antrum and the nose. On examination, a small spicula of bone was found imbedded in the tissues, and this, acting as a foreign substance, produced suppuration. After its removal, the discharge entirely ceased, and the parts rapidly healed.

You will remember the remarks made at the time of the operation in reference to the character of the repair which ensues upon a loss of substance in the superior maxilla. It was then stated that, in these cases occurring in the adult, the periosteum makes no effort at repairing the loss which has taken place. This statement is verified in the case before us, for you will observe, on examination, that although the periosteum has been carefully preserved, no osseous tissue has been formed. The superior surface of the cavity, left by the removal of the necrosed bone, is formed by the roof of the antrum, (its floor and external wall having been removed,) and it is covered by its normal mucous membrane, which is much thickened by reason of the inflammation which invaded the antrum subsequent to the involvement of the alveolar process.

This failure on the part of the periosteum of the superior maxilla to reproduce bone is a remarkable exception to the general rule, which governs its action in other parts, and thus far remains without satisfactory explanation.

This case has progressed very satisfactorily—the parts are in a good condition, and the general health of the patient is much improved. He is somewhat annoyed by the passage of fluids from the mouth into the nose through the opening which exists between the cavity of the antrum and the nose—this opening is, as you see, quite small, and its size will be further diminished by the contraction of the surrounding tissues. When the parts are in proper condition he will have adapted an artificial denture, made so as to fill up the cavity, thereby occluding the opening, improving his speech, and removing the slight deformity which now exists.

Later in the session an artificial denture was adapted by Dr. J. M. Barstow, the Demonstrator of Mechanical Dentistry, which fulfilled the indications presented in every particular, and gave the patient entire satisfaction. His health was greatly improved, having gained nine pounds in weight in six weeks' time.

January 11th, 1871.

The case of necrosis of the superior maxilla, which has been under our observation recently, has afforded us, gentlemen, an opportunity of studying, in connection with the primary involvement of the alveolar process, disease of the cavity of the antrum. On a former occasion we considered the subject of growths within the antrum, directing our attention more especially to tumours originating in the cavity. The form of disease presented in this case is classified among the cystic diseases of the antrum, and is designated as *suppuration in the antrum, or abscess*. Before entering upon the consideration of this condition, it will be interesting to examine into the anatomical relations of this cavity. Although its existence has been known from an early date in the history of anatomical investigations, it did not receive very careful study until the efforts of Highmore inseparably associated his name with the cavity, so that it is known and described in systematic works as the *antrum of Highmore*. It was described by him as "conical and somewhat oblong," and the drawings with which his work was illustrated were made to conform to this description. It is now more correctly described as a "large triangular-shaped cavity, with apex directed outward, and formed by the malar process, its base by the outer wall of the nose, its roof by the orbital plate, and its floor by the alveolar process." Anteriorly, it is bounded by the facial surface; posteriorly, by the zygomatic. Its base presents a large irregularly-shaped opening, which, in the articulated skull, is almost entirely closed by articulation with the ethmoid above, the inferior turbinate below, and the vertical plate of the palate behind. By means of the small aperture the cavity of the antrum communicates with the middle meatus of the nasal fossa, and through this opening the mucous lining membrane of the nasal fossa is prolonged, and becomes the lining membrane of the antrum. It is important for you to understand the size and position of this opening, for you will observe, as we continue the consideration of the case before us, that a knowledge of its position may be of value in determining the extent to which the cavity is involved.

According to Mr. Cattlin, (Transactions of the Odontological Society of London, Vol. II,) the examination of a hundred specimens showed the cavity of the antrum to be larger in the male than in the female, and gave the average size to be that capable of containing two drachms and a half of fluid. Much variety of size and configuration exists in the antra.

Frequently they are unsymmetrically developed, one being larger than the other. Often the cavity is found to be sub-divided by bony ridges, and sometimes it may extend into the malar process, forming a cavity there.

Projecting into the floor are the conical processes, which correspond to the roots of the first and second molar teeth. Sometimes the thin lamina of bone, which normally covers the apices of the roots of the first and second molars, is wanting, and the teeth are therefore in direct communication with the cavity. This fact will explain to you the readiness with which inflammation affecting these organs is imparted to the lining membrane of the antrum; in truth, the normal thin osseous lamina opposes but a feeble barrier to the extension of disease, implicating, as you witness it in this case, the alveolar process.

Having studied the anatomical relations of the cavity, let us proceed to the consideration of those affections which are described as cystic diseases of the sinus. These are designated as *suppuration in the antrum*, or *abscess*, and *hydrops antri*, or *dropsy of the antrum*.

Ordinarily, the cause of the former can be directly traced to diseased conditions of the teeth in relation with the cavity, through which inflammation is transmitted to the lining membrane of the antrum, and, progressing without interruption, eventuates in suppuration. Occasionally it happens that an abscess may form in the alveolus, and burst into the antrum, although connected with teeth not in relation with the cavity. Such appears to have been the fact in this case, for you will recall the statement of the patient, that he located the trouble originally in the alveolus of the first bicuspid tooth. Other causes are enumerated as concerned in the production of this condition, such as violent blows upon the cheek, pressure occurring during birth, catarrhal inflammation, and the entrance of a foreign body into the cavity.

The symptoms of abscess are such as indicate the beginning stage of inflammation—dull, deep-seated pain over the region of the cavity, and extending to the forehead and temporal fossal, with swelling and tenderness of the affected side of the face, accompanied by more or less febrile movement and constitutional disturbance. If the inflammation is permitted to progress, the suppurative stage soon supervenes, and the sinus becomes distended by the accumulation of pus, which may escape, when the cavity is sufficiently full, through the naso-antral (if we may be allowed to so designate it,) opening. If this does not occur, and it is described by authorities as rarely happening, the distention increases, the walls are bulged out, (becoming thin by the process of absorption which takes place,) encroaching upon the cavity of the orbit above, or forcing out the anterior wall. The pus, if not evacuated, forces its way through the thinned bone, and escapes by the side of the teeth, through the front wall,

or possibly through the orbital plate. In these cases considerable destruction of bone occurs, and the soft tissues are marked by an unseemly cicatrix. Very serious results are liable to follow involvement of the cavity of the orbit, by reason of the extension of the inflammation to the structures of eye, producing, as is recorded in some cases, permanent amaurosis. The inflammation may, indeed, extend beyond the orbit into the cranial cavity, and death ensue as the result of inflammation of the brain, or its membranes. A case of this kind is reported in the *Edinburgh Medical Journal* for 1866, by Dr. Mair, of Madras, and is incorporated in the excellent work of Mr. Heath on the Diseases and Injuries of the Jaws.—(Appendix, Case XII.)

The *diagnosis* of suppuration in the antrum is not usually attended with much difficulty, the rapid invasion of the disease and the character of the symptoms pointing clearly to the location of the affection. When the cavity is filled with pus and the distended walls thinned by absorption, a peculiar crackling sound can be elicited by pressure, which may be accepted as diagnostic. In the case under consideration, you will remember that the escape of pus from the nose was the symptom which induced the dentist to pronounce the disease as located in the antrum. In order to make this fact valuable, in a diagnostic point of view, it is essential that the nasal fossa should be subjected to careful examination in order to determine its freedom from disease.

There are several forms of chronic suppuration occurring in connection with the teeth, the bone and the antrum, which, by reason of the slow expansion of the jaw which attends them, may be mistaken for solid growths. In some of these instances extirpation of the bone has been undertaken through error in diagnosis.

As suppuration in the antrum so frequently results from diseased teeth, the first indication to be fulfilled in the *treatment* consists in the prompt removal of all carious teeth or roots in the affected jaw. Those teeth which are apparently sound should be tested by a sharp blow with some metal instrument, and if found at all sensitive should be promptly extracted. This treatment, combined with fomentations and leeching, may frequently stay the further progress of the inflammation. If pus has been formed its early evacuation becomes a matter of paramount importance, and should be accomplished by the extraction of a molar tooth, and the passage of a trocar through one of its outer sockets. Mr. Salter advises, in case that the teeth are all sound, the selection of the first molar for the purpose, and he gives as his reasons the facts that the alveolus is deeper and that it presents a greater liability to decay than the other teeth.

If it is thought advisable, the cavity of the antrum can be evacuated

by perforating the wall above the alveolar border. The objection to this plan is that the drainage cannot be well maintained.

After evacuation of the cavity it is highly important that it should be well cleansed, and this can be accomplished by means of a curved canula adapted to an ordinary syringe. With this the cavity can be thoroughly washed out with warm water, and afterwards the lining membrane treated by the injection of medicated lotions. For this purpose carbolic acid, permanganate of potassa, chlorinated soda, in proper strength, or astringent preparations containing the sulphate of zinc, &c., may be employed. The opening into the cavity should be kept plugged in order to prevent the entrance of particles of food which would serve, if admitted, to maintain the inflammation.

The other cystic disease of the antrum, to which your attention is directed, is that known as *hydrops antri*, or *dropsy of the antrum*, as it is commonly designated. The symptoms of the affection are those which mark a gradual dilatation of the jaw, characterized by an entire absence of the phenomena of inflammation. The pressure exerted by the gradually accumulating fluid acts upon the walls of the cavity so as to force out the anterior wall, depress the palatal vault and occlude the nasal fossa by the bulging of the internal wall. The extraction of a molar tooth and perforation through its socket, gives vent to a clear or yellowish serous fluid, frequently containing flakes of cholesterine. After removal of the fluid, the cavity contracts, the opening made in perforating the alveolus closes, and the bone resumes its normal relations. This constitutes the *treatment*. The *diagnosis* of this affection is not difficult—the gradual and painless character of the swelling, conjoined with the crackling sensation imparted to the fingers on making pressure, are sufficiently diagnostic in their nature.

An interesting point in the consideration of this disease relates to its pathology. Formerly, the accumulation of fluid in the cavity was accounted for by the supposed closure of the opening between the antrum and the nose, by reason of which the mucous secretion, which was thought to be constantly formed by the lining membrane, was prevented from passing off. In accordance with this view, an operation was recommended for re-opening the orifice by means of probes, and subsequent treatment of the condition by injections. Later investigations, based upon the examinations of the fluid found in these cases, showed that this view of the pathology of the disease was incorrect, since the composition of mucus and the contained fluid differed materially. On analysis it was found to resemble closely the fluids contained in cystic growths, and hence it was inferred that the disease originated in the development of cysts within the antrum, or in connection with the roots of the teeth.

Editorial.

DENTAL COLLEGES.

The period of instruction in our Colleges having closed and the commencements held, it is with gratification that we are able to report full classes. By reference to the report of the Pennsylvania College, it will be observed that the usual number of students took advantage of the instruction there offered. It is evident there has been no diminution of the interest in collegiate instruction in the profession, but, on the other hand, a marked increase, judging by the numbers matriculated here and elsewhere. To us this is full of encouragement, as it evidences an increasing healthy sentiment that must result in obliterating the old and most defective mode of dental instruction.

If dentists everywhere would earnestly co-operate with the Colleges, the stigma of quackery would soon be banished from our ranks. It is folly to undertake to shift the blame of our own shortcomings on vulcanite and amalgam so long as a feeling of jealousy or of fault-finding with these institutions is allowed to prevail. Criticism is valuable when conducted in the right spirit, but when it evidently proceeds from narrow-minded prejudice or an overweening self-conceit, it operates only to the injury of all concerned.

That Colleges fall far short of what all hope for is certain; but this is true of all human endeavors. The question simply is, are they the best means attainable for the accomplishment of the end in view. We have no hesitation in answering affirmatively. More than this, they are not only the best but the *only means* whereby a student can become fitted to practice the profession. It is too late to urge the possibility of any one preparing himself in the laboratory for practice without the additional benefit of college instruction. The advancements made in science require an enlarged education. This can never be given by *one man*, but must be by the combined efforts of many. The indications are that we are approaching a radical change in educational processes. That there is great room for improvement all must admit. To accomplish this, all hypercriticism should cease, and in its place an earnest co-operation must be felt and shown with those who are striving to elevate the profession.

PENNSYLVANIA STATE DENTAL ASSOCIATION.

We would ask special attention to the call for the annual gathering of the Pennsylvania State Association, to be found in another part of this journal. It is to be hoped that this meeting will be fully attended. The

importance of keeping up such organizations, whether State or National, cannot be over-estimated. Many are disposed to regard them more in the light of social gatherings, without much real benefit in the way of scientific progress. This may be true, and we are inclined to agree with the opinion; but it must be acknowledged that their influence for good is all-powerful in stimulating research, in elevating the tone, and in bringing men nearer together. That they do all these must be admitted, and it therefore becomes our duty to aid, in every way, to make them attractive and interesting. We therefore hope the Gettysburg meeting may be one full of value to all who may be able to be present.

PYROXYLIN BASE.

This new base is receiving considerable attention, and from its many attractive features will undoubtedly claim wide notice. At this period few or none, outside of the proprietors, have had any experience in manipulating it. It is, therefore, impossible to hazard an opinion of its merits. Most of the profession are already familiar with the collodion base. The only difference, of which we are aware, between this and that, is in the solution of the gun cotton. The solvent of this is camphor. The material is formed into plates approximating the shape of the mouth. They are then kiln-dried to prevent future shrinkage. This process completed, they are ready for use. To apply them, the case is fitted and placed in a flask, in the same manner as rubber. The base is laid loosely around the teeth and the two sections of the flask brought in juxtaposition. It is then immersed in olive oil for about fifteen minutes, and the temperature raised to 300°. When this point is reached the flask is brought together with a screw. As soon as this is accomplished, the whole is removed from the oil and immersed in cool water. The work is now completed except the final finishing. This, in brief, is the mode adopted.

That the cases seem to present all the advantages of rubber, cannot be denied, and time may prove it far superior; but it seems to us there are some difficulties yet to be overcome to accomplish this.

Our attention has been called to some specimens of pyroxylin prepared by other processes and kept exposed to the air, that had become as brittle as glass. When first received they presented all the toughness characteristic of the material. Whether this will be the result in the mouth, of the present preparations, remains to be seen. Again, the taste and smell of camphor is so marked, that we think it constitutes a serious, if not fatal, objection.

Should its success be assured, we shall only have the evils of rubber ten-fold augmented. When fifteen minutes will make a set, exclusive of

making model case, filling the flask and finishing, what has mechanical dentistry to hope for? If the introduction of such processes resulted only in giving artificial substitutes to the poor, we would be the last to object: but we doubt whether this is attained. We do know that it has built up an army of adventurers, who are daily robbing the very people they profess to serve.

OBITUARY.

We are called upon to record the death of Dr. P. A. PRETERRE, which occurred in New York, in October last. He was the eldest of five brothers, all practicing dentistry. While we condemn, and ever must, the peculiar modes adopted by this gentleman to secure practice, we remember him socially as a very genial man, and one by no means deficient in scientific information. While criticising his professional career, we must pay him the just tribute of having set an example, worthy of imitation, in taking two full courses in a Dental College at an advanced period in life.

It is with no little regret that the members of the Faculty of the Pennsylvania College of Dental Surgery announce the retirement of Dr. Buckingham from the position of Dean, which he has held, with so much credit to the School and to himself, during the past six years. During the early part of his presidency at least, the administration of the affairs of the College required unusual powers, and to the excellent judgment with which he has always conducted them, as well as to the liberal sacrifices of time which he has so long made to college matters, we believe are largely due the present prosperity and acknowledged permanence of the school.

Regretting, as they deeply do, that his recent ill health seems to justify the retirement of so valuable and tried an officer, they feel hopeful, also, that in securing as his successor, a gentleman so well known and eminent in his department as Dr. Wildman, they will satisfy the friends and supporters of the college that its executive department is well provided for.

In rearranging the business management of the College with a view of making a more equable division of its labors, they have also appointed a Secretary, a Treasurer and two Managing Editors of the Journal. To the former position they have selected Dr. James Truman, 1221 Spruce street, to whom is entrusted the distribution of the Announcement and Journal, and to whom it is hoped that correspondence and exchanges will be addressed.

Dental Associations.

REPORT OF PROCEEDINGS OF PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a monthly meeting of the Association held February 15th, 1871, the subject being

FUSIBLE METALS,

Dr. Barker read a paper from Dr. James Lewis on this subject, which will be found in another part of this journal. Letters were also read from the same gentleman detailing some experiments. He also enclosed a sample of alloy that he considered superior to any now in use.

Dr. Wildman considered Dr. Lewis in error in supposing Weston's metal to be pure tin. It takes a sharper impression of the mould than pure tin. He has seen cases, where, by exposure to the atmosphere for a long time, they had become much tarnished, far more so than would have been the case with pure tin. It probably contains some antimony.

The use of tin as a base was introduced to the profession in 1820 by Dr. Hudson. Again, in 1836, Dr. Boyce called attention to its use, and subsequently to this, in 1850, Dr. George E. Hawes gave a detailed description of the method of mounting teeth on tin base alone, or attaching them to gold plate by means of block tin. About this latter date, it was used to a considerable extent by many dentists, but on the introduction of hard rubber as a base it fell into disuse.

He presented a case with silver base, having the blocks attached by casting tin around them, which had been worn some six years. Tin, in direct contact with gold or silver, becomes changed in character and is rendered brittle, after having been worn in the mouth. This he attributed to galvanic action. He had made many temporary sets on silver base, with blocks fastened by tin, but had never secured blocks to a gold plate but once. This case was worn fourteen years and did good service until the latter part of the time. He could not recommend it for so called permanent sets. He considered this an exceptional case.

In making this kind of work, or that of the fusible alloys, the plaster composing the mould should contain a large proportion of silex, feldspar or asbestos, to render it more porous and prevent the mould from cracking by the heat to which it would be subjected. Vent holes should be made leading from the most elevated part of the mould, to allow a free egress of air.

The mould, at the time of pouring, should also be heated nearly or

quite up to the fusing point of the metal cast into it, to prevent it from becoming chilled before it could fill the mould accurately.

He had never made a practical case of the fusible alloys, not having sufficient confidence in this mode of inserting teeth. He had more in the indestructibility of pure block tin. Some of the alloys take a more accurate impression of the mould and give a fine finish; but he doubted their resisting the acids of the mouth as well as tin.

Dr Blandy's fusible metal, called cheoplasty, is a composition of tin 10, bismuth 1, antimony 1, silver 1.

Dr. Buckingham had had but little experience, and that not very favorable. He had made a few sets. Is this work any better than rubber? Is it not made with a view of avoiding rubber patents? In his judgment, all these alloys were prepared in about the same manner. He had no doubt but that if formulæ were procured from the manufacturers of britannia ware, that their varied experience would give far better results. He had found that britannia metal would remain untarnished for a long time. He was not familiar with its composition. In his answer to the question, What occasions the brittleness of tin? he replied, he believed it was caused by lead—transformed into oxide of lead it becomes brittle. None of these metals are as good as silver. What is the advantage of aluminum over silver? The former becomes dark. The fluids of the mouth may act on and destroy it. He had examined it in every phase and could not see any advantage to be derived from its use. He greatly preferred, for his own use, a set of rubber to that of aluminum. He did not, however, object to experimenting, as something useful may result from it, but would like to see a greater variety of applications and not confine all experimenting to tin.

In answer to a question of Dr. Barker, in regard to combining in atomic proportions, he said, some metals would mix in all proportions, but this was not the case with all metals. Zinc would combine in certain proportions.

ALUMINUM.

Dr. Barker's plan of soldering aluminum was quite simple, but required manual dexterity. Take aluminum plate, stamped and free from grease, and by the aid of pliers hold a piece of tin in contact with it over an alcohol lamp. In a short time the whole plate becomes tinned. The plate is returned to the cast, the teeth fitted and packed in the usual manner for rubber work. They are then taken out, cleaned, placed back, and pure tin flowed round them. By this process there is a perfect union between the two metals.

He had with him a patent flask, of Dr. A. Lawrence's invention, intended for pouring aluminum. The investment used was silex and plaster, or fine sand and plaster combined. The metal should then be poured.

In answer to a question of Dr. William Trueman, whether the tin formed a perfect union, Dr. B. said, it united as solder. There is considerable art in doing this. When aluminum plate is held over the alcohol lamp, you must have an instrument to flow it, or you will fail. His experience with aluminum in the mouth, was, that it kept its color and does not become brittle.

One of the difficulties in working this metal is to get a sharp plate. He had tried chasing, as suggested by Dr. Wildman, but it did not stand this process well. This seemed to him one of the principal objections.

Dr. William Trueman had met with a partial case, with the teeth fastened on with rubber that had been worn three years. Holes had been punched through the plate to secure the rubber, but either the aluminum or the rubber had given way as there was quite a space between them.

In another case, worn some eighteen months, the teeth were fastened on with fusible metal. The aluminum was perfect, except under and around the fusible metal, where it was very much roughened and very brittle. Nearly all the teeth had broken off, the fusible metal having given way. The latter was very much discolored and evidently contained cadmium. In each of these cases the aluminum had retained its color very well, much better than silver usually does.

Dr. Buckingham called attention to the difficulty of flowing aluminum.

Dr. Wildman inquired if any member had made aluminum bronze? He had had great difficulty in finding a suitable flux. He had used borax and several other fluxes, but they adhered to the surface of the fused metal so as to prevent it from pouring clean from the crucible. As it requires several meltings to bring it to a working condition, this causes much loss of material. The copper and aluminum composing it must be pure. In making it, first melt the copper and then add the aluminum. The proportions of 90 of copper and 10 of aluminum make a pale gold color; 95 of copper and 5 of aluminum, a deep color, while $92\frac{1}{2}$ of copper and $7\frac{1}{2}$ of aluminum give a medium color, closely resembling twenty karat gold. He exhibited a specimen made according to the latter formula. This had been exposed to the atmosphere for a year, with very little diminution of its lustre. Debray says, "an alloy of 90 parts of copper and 10 of aluminum is harder than common bronze, and is capable of being worked at high temperatures easier than the best varieties of iron. Larger quantities of aluminum render the metal harder and brittle." The specimen exhibited was equal in hardness to wrought iron.

Dr. Buckingham suggested lime and silex as a flux for aluminum. T.

THE ASSOCIATION OF THE ALUMNI OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The first annual meeting of this Association convened in the College on Saturday morning, February 25th, there being forty-one members present. Most of the students of the college were also present as visitors.

Minutes of the meeting to organize the Association were read and approved.

The President of the Association, Prof. James Truman, then delivered an address, which will be found in the current number of the *TIMES*.

The Secretary was requested, by a unanimous vote, to write on the part of the Association to the chairman of the committee of the Legislature having in charge the bill regulating the practice of dentistry in this State, urging its passage.

Several amendments to the Constitution were offered, to be acted upon at the next annual meeting.

A committee was appointed to take into consideration the propriety of making this a scientific organization, in connection with its social character, with instructions to report at the next annual meeting.

The following officers were then elected for the ensuing year:

President—Prof. GEO. T. BARKER.

Vice-President—Dr. Charles S. Stockton.

Recording Secretary—Dr. E. R. Pettit.

Corresponding Secretary—Dr. W. G. A. Bonwill.

Treasurer—Dr. H. E. Neal.

Executive Committee—Drs. James Truman, R. Walker, E. Wildman, (Philadelphia;) Charles Moore, (Pottstown, Pa. ;) S. H. Guilford, (Lebanon, Pa.)

After the transaction of some further business, not of general interest, Dr. Bonwill, by request of the Association, exhibited and explained his new electrical mallet, after which the meeting adjourned.

The number of members present, and the interest manifested in the proceedings of the Association, at this, its first annual meeting, indicate its success beyond a doubt. The Executive Committee were unable to provide for a social reunion this year, but as arrangements will be made for holding one at the next meeting, it is expected a much larger number will be present. The notices of this meeting were unavoidably delayed, which prevented many from attending on account of previous engagements. It is hoped that many of the Alumni will prepare essays upon subjects of interest to the profession, to be read at the next annual meeting. Those who may prepare such essays, and who may be prevented from attending the meeting on account of distance, or other cause, may have them read before the Association, if forwarded in time.

E. R. PETTIT, *Recording Secretary*.

THE STATE DENTAL ASSOCIATION.

The regular annual meeting of the State Dental Association of Pennsylvania will be held at Gettysburg on the second Tuesday in June, (13th inst.,) 1871.

A full attendance of the members of the Society is earnestly requested; and it is desirable that local Associations be careful to elect delegates who will be sure to attend.

The session will be of three days' duration, and will be rendered interesting and instructive through the essays and the discussions upon them.

A programme will in due time be prepared and published by the Executive Committee, together with the subjects of the essays.

Members of the dental profession, who are not members of the State Society, in this and in other States, are cordially invited to attend.

Arrangements will be made with the railroad companies throughout the State for tickets, or orders for tickets, at excursion rates, for which application should be made to the undersigned about the 1st of June.

Those who wish to avail themselves of the benefit of the above arrangement, will please designate the route they propose taking to reach Gettysburg, so as to avoid confusion in the distribution of the same.

Local Societies that have elected delegates will please communicate their names to the undersigned as soon as possible, after their appointment.

SAMUEL WELCHENS, *Corresponding Secretary*,
Lancaster, Penna.

THE FIFTEENTH ANNUAL COMMENCEMENT OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Fifteenth Annual Commencement of this College was held at Musical Fund Hall, on Saturday evening, February 25th. Notwithstanding the unfavorable weather, the Hall, as is usual upon this occasion, was densely crowded with an intelligent and appreciative audience. The Germania Orchestra enlivened the exercises with choice selections of music.

The opening prayer was offered by the Rev. Dr. Nevin, after which the Degree of Doctor of Dental Surgery was conferred upon the following members of the class by Henry C. Carey, President of the Board of Trustees:

GRADUATES, 1870-'71.

Amacey B. Abell, Jr., Pa.,.....Artificial Appliances for the Mouth.
Ernst Alexovitz, M. D., Austria,.....Embryology of Teeth.
Wm. B. Antrim, Pa.,.....Treatment and Filling Pulp Cavities.
Joseph C. Barnum, N. Y.,.....The Exposure of Pulp by Caries and Treatment.
Heinrich Beraz, M. D., Bavaria,.....Inflammatory Diseases of the Mouth.
Andres E. Brunet, Cuba,.....Affections of the Teeth.
Edward G. Brunet, Cuba,.....Stomatitis.
H. W. Buchanan, Pa.,.....Filling Teeth.
Charles E. Cauffman, Pa.,.....Extraction of Teeth.
L. D. Caulk, Pa.,.....Human Teeth.
Edmond Coquard, Mich.,.....Extracting Teeth.
Sylvanus Davis, Pa.,.....The Dentist as an Instructor.
Thomas W. Dobbins, N. J.,.....Inflammation.
George R. England, Pa.,.....Salivary Calculus.
Pedro F. Fernandez, Cuba,.....Diseases of Antrum, or Maxillary Sinus.
Jose Garcia Gonze, Porto Rico,.....Hysteria.
Harvey C. Gilcrest, N. Y.,.....Temporary Teeth.
Robert I. Hampton, Ga.,.....Adhesive vs. Non-Adhesive Foil.

Daniel Hopps, Fla.,	Exposed Pulp.
Edwin T. Hutchinson, Ill.,	Inflammation of Dental Tissues and their Thera-
Wm. S. Jewett, Me.,	Treatment of Inflammation. [peutics.
S. A. Keltner, Ohio,	Impressions.
Erastus H. Leffler, Pa.,	Necrosis.
Antonio Lezama, Cuba,	Affections of Superior Maxillary Bone.
J. Edward Line, N. Y.,	Chloroform.
Thomas Linn, Pa.,	Important Dental Operations.
Wm. M. Martin, Pa.,	Preservation of Teeth.
Robert F. Phillips, Fla.,	Preservation of Children's Teeth.
Joaquim E. Plana, M. D., Cuba,	Inflammation.
Manuel Roca, Cuba,	Odontalgia.
Moses C. Steeves, St. John's, N. B.,	Development of Human Teeth.
James M. Stewart, Pa.,	Treatment of Exposed Pulp.
A. Pierpont Todd, N. Y.,	Teeth and their Diseases.
A. P. Tompkins, Pa.,	The Principles and Science of Dentistry.
John R. Thompson, S. C.,	Inflammation.
Robert F. Tull, Md.,	Neuralgia.
James Wright, Pa.,	Physiological Sympathy.
S. Zimmerman, Canada,	The Internal Maxillary Artery.
Total,	38.

The following comprises a list of the Matriculates of the past Session :

MATRICULANTS—FIFTEENTH ANNUAL SESSION, 1870-'71.

MATRICULANTS.	RESIDENCE.	PRECEPTORS.
Amacey B. Abeil, Jr.,	Pennsylvania,	Dr. A. M. Asay.
Ernst Alexovitz, M. D.,	Austria,	Dr. G. T. Barker.
Wm. B. Antrim,	Pennsylvania,	Dr. T. Brown.
George W. Barnes,	Pennsylvania,	Dr. A. M. Asay.
Joseph C. Barnum,	New York,	Dr. L. C. Barnum.
Francis L. Beecher,	Minnesota,	Dr. Beecher.
Heinrich Beraz, M. D.,	Bavaria,	Dr. J. Truman.
Charles Bonsall,	Pennsylvania,	Dr. W. H. Trueman.
H. M. Brewer,	Pennsylvania,	Dr. G. T. Barker.
Andres E. Brunet,	Cuba,	Dr. G. T. Barker.
Edward G. Brunet,	Cuba,	Dr. Beardslee.
F. Brunet, D. D. S.,	Cuba,	
H. W. Buchanan,	Pennsylvania,	Dr. E. J. Greene.
Thomas W. Buckingham,	Pennsylvania,	Dr. T. L. Buckingham.
Joseph B. Carhart,	Pennsylvania,	Dr. Hartlevan.
Charles E. Cauffman,	Pennsylvania,	Dr. C. Sheaffer.
L. D. Caulk,	Pennsylvania,	
Joseph R. Clements,	Wisconsin,	Dr. G. H. Crarey.
Edmond Coquard,	Michigan,	Dr. H. Cowie.
H. A. Dalrymple,	Massachusetts,	Dr. S. B. Pike.
Sylvanus Davis,	Pennsylvania,	Dr. G. T. Barker.
Wm. B. De Morat,	New York,	Dr. E. T. Darby.
Thomas W. Dobbins,	New Jersey,	Dr. C. S. Stockton.
George R. England,	Pennsylvania,	Dr. W. H. Trueman.
Pedro F. Fernandez,	Cuba,	Dr. J. Truman.
A. Jameson Fuches, Jr.,	Missouri,	Dr. H. Judd.
Jose Garcia Gonze,	Porto Rico,	Dr. G. T. Barker.
Harvey C. Gilcrest,	New York,	Dr. G. Wright.
Joseph Graham,	Pennsylvania,	Dr. T. L. Buckingham.
James F. Griffith,	North Carolina,	Dr. C. J. Watkins.
Robert I. Hampton,	Georgia,	Dr. J. Whitson.
Wilson M. Harris, Jr.,	Pennsylvania,	Dr. W. M. Harris.
Alfred H. Henderson,	New Brunswick,	Dr. J. E. Griffith.
Charles E. Hilt,	Illinois,	Dr. C. M. Wilkie.
Daniel Hopps,	Florida,	
John H. Holliday,	Georgia,	Dr. L. F. Frink.
Louis G. Houard, D. D. S.,	Cuba,	

Wm. M. Huston,	North Carolina,	
Edwin T. Hutchinson,	Illinois,	Dr. E. Stevens.
William S. Jewett,	Maine,	Dr. S. C. Fernald.
S. A. Keltner,	Ohio,	Dr. J. Carr.
George H. Lathan,	New York,	Dr. H. A. Coe.
Erastus H. Leffler,	Pennsylvania,	Dr. S. H. Witmer.
Antonio Lezama,	Cuba,	Dr. Beardslee.
J. Edward Line,	New York,	Dr. L. D. Walter.
Thomas Linn,	Pennsylvania,	Dr. G. L. Rauch.
Louis W. Lyon,	Minnesota,	Dr. Beecher.
W. G. McClure,	Illinois,	Dr. T. C. Williams.
James W. McHugh,	Pennsylvania,	Dr. E. J. Greene.
R. E. McReynolds,	Georgia,	Dr. J. C. McReynolds.
William M. Martin,	Pennsylvania,	Dr. Doulittle.
Edwin A. Morrell,	Maine,	Dr. E. Wasgatt.
Francis E. Nims,	Massachusetts,	Dr. E. M. Bissell.
Andrew Patterson, Jr.,	Ohio,	Dr. C. H. Scott.
Nelson L. Peck,	Pennsylvania,	Dr. J. Lantz.
Robert F. Phillips,	Florida,	Dr. Asa Hill.
Joaquim E. Plana, M. D.,	Cuba,	Dr. E. Wildman.
Daniel W. Plotner,	Ohio,	Dr. M. C. Sim.
Horace T. Porter, M. D.,	District Columbia,	Dr. Porter.
R. H. Porter,	New Jersey,	Dr. T. L. Buckingham.
J. C. Raymond,	Pennsylvania,	Dr. L. L. Deckard.
Frank H. Robinson,	Illinois,	Dr. O. Wilson.
Manuel Roca,	Cuba,	Dr. A. Yzquierdo.
George T. Ruffell,	Pennsylvania,	Dr. C. B. Ruffell.
Thomas S. Seeley,	Ohio,	Dr. F. N. Clark.
A. W. Smith,	Indiana,	Dr. Busgress.
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A. P. Tompkins,	Pennsylvania,	Dr. T. Ingram.
Robert F. Tull,	Maryland,	Dr. T. H. Musgrove.
E. M. Wolfe,	Pennsylvania,	Dr. Wingate.
James Wright,	Pennsylvania,	Dr. H. Schyler.
S. Zimmerman,	Canada,	Dr. J. Zimmerman.
Total,		74.

We ask the special attention of the members of the profession to the reports of Demonstrators of Operative and Mechanical Dentistry, which are appended. We think no one can consider them carefully, as exhibiting the amount of work performed entirely by the students, without being convinced of the immense advantages possessed by the College, and that dentistry, whether in its theoretical or practical branches, can be better taught in an institution of this character than by any other mode.

Students have patients furnished them as soon as they enter the College, and they are expected to perform all the operations required, beginning with simple cavities, if they have never operated before, and advancing gradually to those which are more difficult—their operations being constantly under the supervision of the Demonstrators. These operations comprise all that are likely to occur in private practice, while, at the same time, many cases are presented that are never seen in the ordinary round of professional duties; besides which, they witness the operations performed by the Professor of Anatomy and Surgery for such diseases of the mouth and associate parts as properly belong to the dental profession, but which dentists are rarely called upon to treat.

DEMONSTRATORS' REPORT, SESSION 1870-'71.

OPERATIVE DEPARTMENT.

Number of Patients visiting the Clinic,.....	3123
Gold Fillings,.....	1479
Tin Fillings,.....	618
Amalgam Fillings,.....	23
Wood's Metal Fillings,.....	3
Hill's Stopping Fillings,.....	163
Oxy-Chloride of Zinc Fillings,.....	109
Superficial Caries Removed,.....	46
Treatment of Pulp and Filling Pulp Cavities,.....	378
" Periodontitis,.....	55
" Alveolar Abscess,.....	131
" Inflammation of Gums,.....	58
" Partial Necrosis of Bone,.....	7
" Necrosis involving the Antrum, and Removal of Portion of Bone,.....	1
Correction of Irregularities,.....	1
Bleaching Teeth,.....	12
Removal of Salivary Calculi,.....	242
Pivot Teeth Inserted,.....	6
Extraction of Teeth and Roots,.....	3433
Total,.....	6765

ELIHU R. PETTIT, D. D. S., Demonstrator.

W. R. MILLARD, D. D. S., Assistant Demonstrator.

MECHANICAL DEPARTMENT.

87 Patients were supplied with the following Artificial Dentures:

Full Upper and Under Sets,.....	18
Full Upper Sets,.....	33
Full Under Sets,.....	2
Partial Upper Sets,.....	32
" Lower Sets,.....	3
Obturator, (Cleft Palate Cases,).....	3
Teeth Mounted on Silver Base,.....	718
" Adamantine,.....	14
" Platina, Continuous Gum,.....	28
" Hard Rubber Base,.....	551
Whole Number of Gum Teeth,.....	1222
" Plain ".....	89
Number of Teeth Mounted for patients,.....	—1311

DEPOSITING CASES.

20 Full Upper Sets on Metallic Base, number of Teeth,.....	282
11 Partial Upper Sets on " " " ".....	56
4 Full Upper Sets, Metal Base, Teeth attached by Rubber, No. of Teeth,.....	56
2 Full Upper Sets on Hard Rubber Base,.....	28
Number of Gum Teeth,.....	410
" Plain ".....	12
Whole number of Teeth on Depositing Cases,.....	422
Total number of Teeth Mounted during Session,.....	1733

J. M. BARSTOW, D. D. S., Demonstrator.

The Valedictory Address was delivered by T. L. Buckingham, D. D. S., Professor of Chemistry. The usual floral offerings of the friends of the graduates were then distributed, and the exercises closed with the benediction.

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The Sixteenth Annual Session, 1871-'72.

PRELIMINARY LECTURES AND INSTRUCTIONS.—The Dispensary and Laboratory of the College will be opened on the 1st of September, where ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability; and during October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical peculiarities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND MICROSCOPIC ANATOMY.

The lectures from this chair will include a consideration of the entire subject of human physiology and physiological chemistry, with such portions of comparative physiology as are essential to a comprehensive understanding of the subject; also, the doctrines of life and organization. They will be amply illustrated by appropriate chemical experiments and vivisections.

The minute structure of the organs involved in the organic and animal functions will be carefully described and illustrated by diagrams and the class microscope.

ANATOMY AND SURGERY.

The instruction in this department will embrace a systematic course of Lectures on Descriptive and Surgical Anatomy, fully illustrated by dissections on the *cadaver*, preparations, models, drawings, &c.

The minute anatomy of the various organs and tissues of the body will be shown by the class microscope, and particular attention will be given to the demonstration of the anatomy of the head and face.

Clinical instruction in the diagnosis and treatment of the surgical diseases of the mouth will be given once a week by the incumbent of the chair. Students will thus have the opportunity of studying oral diseases, and witnessing the operations adopted in their treatment.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the demonstrators.

IN THE OPERATIVE DEPARTMENT.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

IN THE MECHANICAL DEPARTMENT.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

PRACTICAL ANATOMY.—The great facilities for the study of practical anatomy to be found in Philadelphia, in several well ordered and supplied dissecting rooms, present to the student advantages for its prosecution superior to those offered in any other city.

HOSPITAL CLINICS.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

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For the Course, (Demonstrator's ticket included,) - - - - -	100 00
Diploma, - - - - -	30 00

TEXT BOOKS AND WORKS OF REFERENCE.

Gray's, Leidy's, Wilson's, or Sharpey & Quain's Anatomy; Carpenter's or Kirke's Physiology, (English editions); Dalton's or Flint's Physiology; Tyson's Cell Doctrine; United States Dispensatory; Pereira's or Stille's Therapeutics; Fownes Elements of Chemistry; Brandt & Taylor's Chemistry; Lehmann's Physiological Chemistry; Flint's Practice of Medicine; Tanner's Practice; Tomes' Dental Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Wildman's Instructions in Vulcanite Work; Barker on Nitrous Oxide; Gross' or Erichsen's System of Surgery; Paget's Surgical Pathology, or other standard works on the same subjects.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupilage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

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Vol. VII.

JULY, 1869.

No. 1.

THE
DENTAL TIMES,

A Quarterly Journal of Dental Science.

EDITED BY

JAMES TRUMAN, D. D. S.

PHILADELPHIA:

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All exchanges or other matter intended for the Editorial Department of this Journal
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All matters relating to the business management must be directed to T. L. BUCKINGHAM,
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BRANCHES:
767 & 749 Broadway, corner 9th Street, New York.
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March 16th, 1869.

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BUFFALO DENTAL MANUFACTURING COMPANY,

Nos. 247 and 249 Main Street, Buffalo, N. Y.

MANUFACTURERS AND DEALERS IN DENTAL GOODS,

AT WHOLESALE AND RETAIL.

For Alcohol and Gas.



For Kerosene.



Old style.



New Style.

WHITNEY'S VULCANIZERS AND FLASKS

WHITNEY'S VULCANIZER

Is composed of two pieces only, a copper pot, and a brass head that screws on to the pot.

HAYES' VULCANIZING OVENS

Are of copper, of the usual thickness, surrounded with a shell of malleable iron, $\frac{1}{8}$ of an inch thick. The boilers are made with and without the "iron clad" shell.

Pat. Mar. 5, 1861, Apr. 3, 1866.

PRICES.

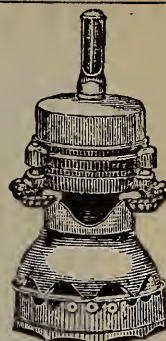
No. 1 (1 flask) Whitney's or Hayes'	\$15.00
No. 2, (2 flask) " "	16.00
No. 3, (3 flask) " "	17.00
No. 1, (1 flask) iron clad oven, Hayes'	15.00
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Gas, Alcohol, or Hayes' Kerosene Burners, at above prices. Union Kerosene Stove \$1.00 extra.

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" bolts in sets of 3, ...	18 "
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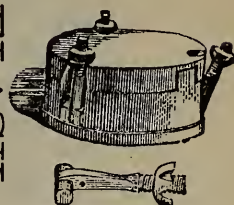
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Iron Clad Oven.



Iron Clad Boiler.



SNOW & LEWIS' IMPROVED AUTOMATIC PLUGGER.



Patented Oct. 30, and Nov. 20, 1866.

This instrument is the most efficient substitute for the mallet and assistant yet devised. The working parts are all contained in the handle. They can be locked by the ring on the handle, enabling the plugger to be used as a hand instrument. This feature is not presented in any other spring plugger in market.

The Rack is designed to hold the points as represented in the cut, and enable the dentist to change them with one hand when operating. The base is of cast iron, sufficiently heavy to retain its place on the table. It will be found to answer the purpose designed perfectly.

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Automatic Plugger, triple gilt, ...	\$14 00
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Points, per dozen, ...	3 50
Enamel Chisels, per set of six, ...	1 75
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Point Rack, ...	2 00

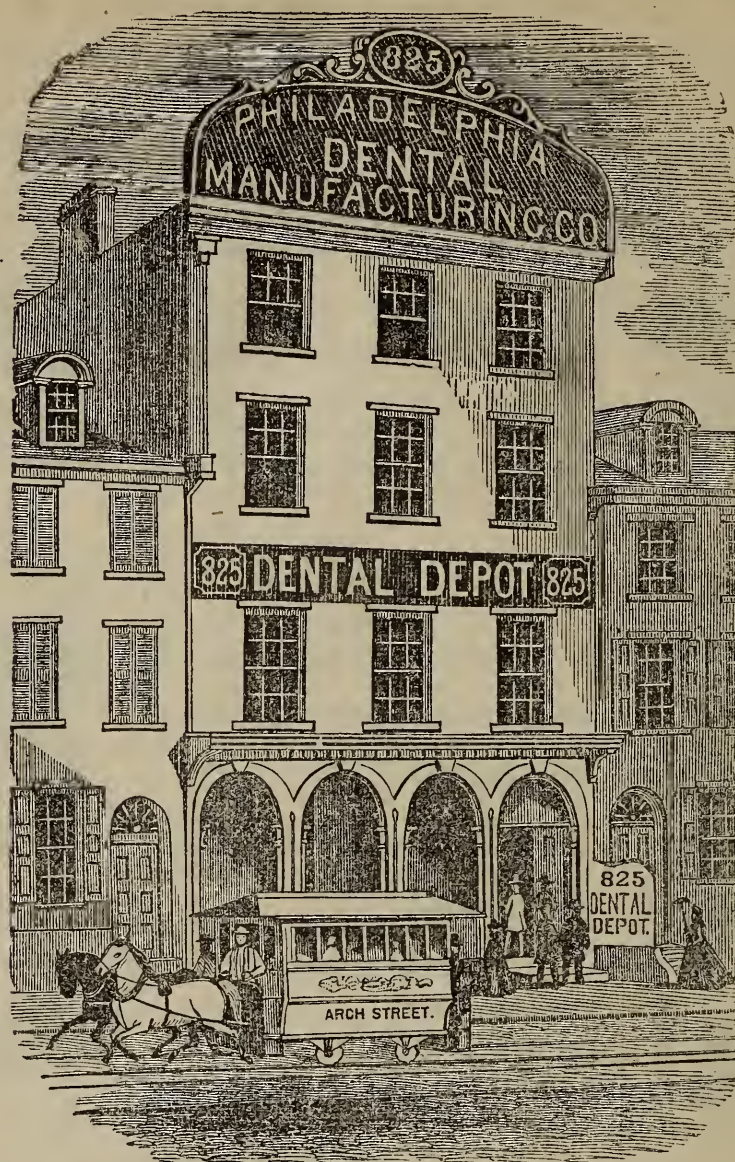
Also manufacturers of various other articles. See advertisement next month.



RACK FOR POINTS.

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Philadelphia Dental Manufacturing Company.



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DEPOT, 825 ARCH STREET,

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SUCCESSORS TO

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MANUFACTURERS OF

PORCELAIN TEETH, GOLD AND TIN FOIL,

Dealers in every variety of INSTRUMENTS and MATERIALS required by the Dentist. All orders carefully and promptly filled. Write plainly, giving name and residence in full, and address as above.

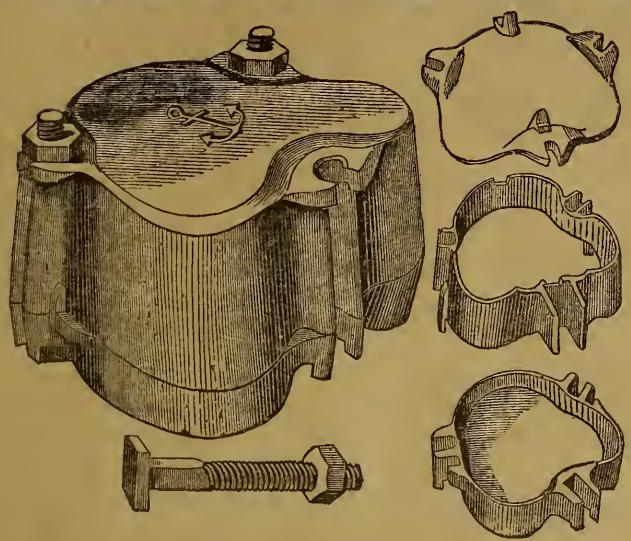
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" "	1 25
" Bolt and Nut,	10
" Wrench,	10

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SUPERIOR DENTAL PLASTER.

Manufactured under our direction, expressly for Dental Purposes, and decidedly the best article in the Market.

Six quart Iron Cans,	-	-	-	\$ 75
Twelve quart Iron Cans,	-	-	-	1 25
Half bushel Iron Cans,	-	-	-	1 60
Three peck Iron Cans,	-	-	-	2 25
Eight quart Wood Pails,	-	-	-	1 00
Half bushel Wood Pails,	-	-	-	1 60
Bushel Wood Pails,	-	-	-	2 75
Quarter Barrel,	-	-	-	2 00
Half Barrel,	-	-	-	3 25
Barrel,	-	-	-	4 75

Porterage extra.

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P. D. M. CO.

Special Notice to the Dental Profession.

PORCELAIN TEETH.

STRENGTH! BEAUTY!! VARIETY!!!

Having greatly increased our facilities and added largely to our variety of patterns of teeth, we are encouraged, by the growing demand, to make a

REDUCTION IN OUR PRICES,

And, therefore, take this method of informing the Dental Profession that the following are the rates at which we will furnish our superior Teeth

RETAIL PRICES.

Gum Teeth 16 Cents Each.

When ordered by the quantity, we will furnish them at the following prices for *cash only*:

For \$25.00, 12 sets of 14 Gum Teeth, (163) being a fraction less than 15c. each.

For \$50.00, 26 sets of 14 Gum Teeth, (364) being a fraction less than 14c. each.

For \$100.00, 55 sets of 14 Gum Teeth, (770) being a fraction less than 13c. each.

Gum Teeth 16 Cents Each.

For \$25.00, 20 sets of 14 Plain Teeth, (280) being a fraction less than 9c. each.

For \$50.00, 42 sets of 14 Plain Teeth, (588) being a fraction over 8½c. each.

For \$100.00, 89 sets of 14 Plain Teeth, (1246) being a fraction over 8c. each.

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Assorted, will be sent by mail, free of charge, to those desiring them.

These will enable the Dentist to decide as to the pattern best suited to any particular case, which can be ordered by the number on back of sample. They will be found very useful.

PHILADELPHIA DENTAL MANUFACTURING CO.

1899—1900

Depot, 825 Arch Street.

Vol. VII.

OCTOBER, 1869.

No. 2.

THE
DENTAL TIMES,

A Quarterly Journal of Dental Science.

EDITED BY

JAMES TRUMAN, D. D. S.

PHILADELPHIA:

PUBLISHED BY THE FACULTY OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY,

AT THE OFFICE OF

Dr. T. L. BUCKINGHAM, Dean, 1206 Vine St.

PRICE, \$1.00 A YEAR IN ADVANCE. SINGLE COPIES 30 CENTS.

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PUBLISHED BY THE
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The TIMES will be issued on the first of the months of January, April, July and October of each year—the volume commencing in July.

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ARTIFICIAL TEETH.



PRIZE MEDAL

AWARDED TO

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1865,

FOR EXCELLENCE IN THE MANUFACTURE OF ARTIFICIAL TEETH

The attention of Dentists is called to our late patterns of

BLOCK TEETH FOR RUBBER BASE.

In claiming for them

BEAUTY, NATURAL APPEARANCE & TOUGHNESS,

We are endorsed by all who have given them a trial, as well as by the fact that we have just received a PRIZE MEDAL at the World's Fair in Prussia, for excellence in the manufacture of Artificial Teeth.

Our assortment of Block Teeth for Rubber Base is quite varied.

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Blocks or Sections for Rubber Base,.....	20 cents.
Single Gum Teeth, " "	20 "
" " Plate Work,.....	20 "
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" " for Rubber Work,.....	10 "
Pivot Teeth,.....	8 "

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Our Teeth for Rubber Work have DOUBLE-HEADED PINS. These are distinct and well formed. One of them is really inserted IN the tooth, the other is at the extremity of the pin, OUTSIDE. We thus secure a firm resistance in the body of the tooth, and ample space for the retention of the rubber around the pin outside. Our customers pronounce them Excelsior."

A Liberal Discount made to Wholesale Dealers.

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ESTABLISHED
1837.

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Both as regards their quality and adaptation to the purposes for which they are intended, a desideratum which will be appreciated by all wishing to purchase Instruments, that are reliable and of long and well established reputation.

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PORCELAIN TEETH AND DENTISTS' MATERIALS.

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jy'69—1y

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In my former advertisements I offered the profession a discount of fifteen per cent. on all bills exceeding a certain amount, which has met with such opposition by the big bugs, followed by all the small fry in the trade, that I am constrained to withdraw the offer, as they one and all refused to continue to make me the usual trade discount. I will, however, continue to make a discount of fifteen per cent. on all Dental Instruments manufactured by my father, Mr. J. D. Chevalier, on bills exceeding \$20, at the prices quoted in the catalogues of the old firm of J. D. Chevalier & Son, except on the following articles, the prices of which are net :

Chevalier's Finest Forceps, warranted for one year, each,	-	-	-	\$2 50
Hand and Mallet Pluggers, with Serrations, finely finished,	-	-		75
Excavators, Burs and Drills, per dozen,	-	-	-	1 50

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Any old Forceps, that are not broken at the joint, can be straightened or curved more or less, both at the beaks and handles, and made as good as new. Old-fashioned Pluggers can be altered into the new styles.

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" " Excavators, Burs & Drills, with Steel Handles, "	5 "
" " and Serrating Pluggers, " "	20 "
" " " " Ivory or Ebony " "	30 "
" " " " Pearl or Cameo " "	40 "
" Polishing Forceps, - - - - - "	25 "
" " Pluggers and Scalers, with Steel Handles, "	10 "
" " " " Ivory or Ebony Handles, "	15 "
" " " " Pearl or Cameo " "	25 "

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Handsomely fitted up with Instruments, on the most reasonable terms.

Thanking the profession for their past favors, and soliciting a continuation of their patronage, I remain, very respectfully,

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Manufactory, 120 Williams street.

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Manufactured by the Proprietor, Albany, N. Y.

The adoption of a strictly cash business, (resulting in a saving of nearly one-third,) with improved facilities in the manufacture, enables me to put these metals at the following greatly reduced rates:

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[The above metals contain no mercury, and hence may be safely used in connection with metal plates.]

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Mercury Gauge, for use in mixing up Amalgam, 25 cents.

Amalgam or Filling Measure, with one cup, 75 cts.; with two cups, \$1.

Postage extra—On material, 9 cts. an ounce; on instruments, 3 cts. each.

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Letters should enclose stamps for return postage. Address,

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September 1st, 1868.

[jy'69—1y]

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PORCELAIN TEETH,
AND IMPORTER AND DEALER IN
DENTISTS' MATERIALS.

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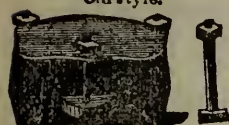
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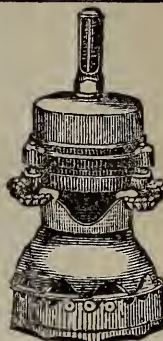
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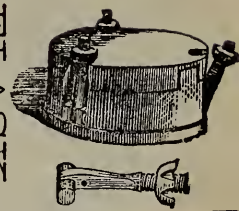
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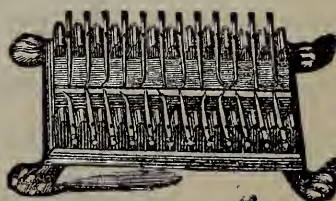
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Points in the rough, per dozen, ...	1 50
Point Rack, ...	2 00



RACK FOR POINTS.

Also manufacturers of various other articles. See advertisement next month.

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Enamelene

Prepared from
Dr. Barker's Formula.

A FIRST-CLASS ARTICLE OF TOOTH POWDER,

Prepared in the very best manner, of the choicest materials; each ingredient being soluble in the saliva and designed expressly for dental patients. The formula is not kept a secret, but will be forwarded on application to the undersigned. We are prepared to furnish

ENAMELENE

In Glass Jars or Glass Bottles holding one pound; White Glass Boxes, neat Paper Boxes, (round or oval,) and Glass Bottles holding THREE OUNCES, with metal top designed for placing a sufficient quantity of the Powder on the brush without opening the bottle, thereby retaining the perfume and facilitating the use of the article.

We can also furnish

BEAUTIFUL ILLUMINATED LABELS,

Printed on stone, in three colors, of different sizes, (round or oval.)

The heading of this advertisement is of the size and pattern of Label for large bottles or cans, being identical, except in coloring.

The ENAMELENE is placed at the exceeding low price of

ONE DOLLAR PER POUND,

at which it will be sold in 1, 2, or 4 lb. cans without extra charge. All the different kinds of boxes, bottles, jars and labels furnished at correspondingly reasonable rates.

It is our design to put up a choice article of Tooth Powder that Dentists may confidently recommend to their patrons, that will arrest the accumulation of tartar, prevent decay by neutralizing acids and decomposing food, and at the same time be agreeable to patients and attractive in appearance.

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We have made arrangements and are prepared to perform for the profession

ALL KINDS OF MECHANICAL WORK

that may be intrusted to our care, in the best manner, and returned with dispatch, and satisfaction guaranteed.

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RUBENCAME & BARKER.

RUBENCAME & BARKER,

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Depot, 825 Arch St., Philadelphia, Pa.

MANUFACTURERS OF

Porcelain Teeth, Gold & Tin Foil,

*Dealers in every variety of INSTRUMENTS and MATERIALS
required by the Dentist.*

☞ All orders carefully and promptly filled. Write plainly, giving name and residence in full, and address as above.



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The above engraving represents a No. 2 Archer's Chair, No. 2 Footstool, and No. 1 Instrument Stand. The Chair is covered with plain plush, and trimmed with porcelain nails. Price, without nails, \$61.00; with nails, \$63.00.

☞ All Dental Furniture, of Archer's and Snowden's and Cowman's makes, for sale at manufacturers prices.

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SUCCESSORS TO

Philadelphia Dental Manufacturing Co.,

DEPOT: 825 ARCH STREET,

PHILADELPHIA, PA.

Having purchased the entire interest and stock of Dental Goods and manufacturing facilities of the Philadelphia Dental Manufacturing Company, we invite the attention of the Profession to our

LARGE AND VARIED ASSORTMENT OF

ARTIFICIAL TEETH,

AND EVERY VARIETY OF

Dental Goods for Office or Laboratory Use.

RETAIL PRICES:

GUM TEETH, 16 CENTS EACH.

When ordered by the quantity, we will furnish them at the following prices for *cash only*:—

For \$25.00, 12 sets of 14 Gum Teeth, (168,) being a fraction less than 15c. each.

For \$50.00, 26 sets of 14 Gum Teeth, (364,) being a fraction less than 14c. each.

For \$100.00, 55 sets of 14 Gum Teeth, (770,) being a fraction less than 13c. each.

PLAIN TEETH, 10 CENTS EACH.

For \$25.00, 20 sets of 14 Plain Teeth, (280,) being a fraction less than 9c. each.

For \$50.00, 42 sets of 14 Plain Teeth, (588,) being a fraction over 8½c. each.

For \$100.00, 89 sets of 14 Plain Teeth, (1,246,) being a fraction over 8c. each.

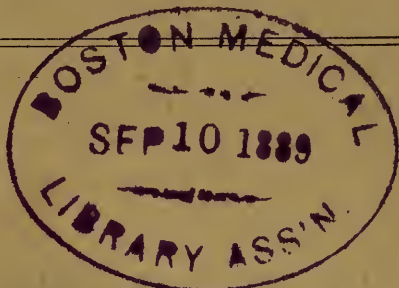
Assorted samples of Teeth will be furnished by mail, free of charge. These will enable the Dentist to decide as to the pattern best suited to any particular case, which can be ordered by the number on the back of sample.

Manufacturers of Rubencame & Barker's Gold Foil, Anchor Rubber, Anchor Flasks, Barker's Gasometer Mouth Piece and Hood.

Vol. VII.

JANUARY, 1870.

No. 3.



THE

DENTAL TIMES,

A Quarterly Journal of Dental Science.

EDITED AND PUBLISHED BY

THE FACULTY

OF THE

Pennsylvania College of Dental Surgery.

PHILADELPHIA.

PRICE, \$1.00 A YEAR IN ADVANCE.

SINGLE COPIES 30 CENTS.

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THE DENTAL TIMES,

A QUARTERLY JOURNAL OF DENTAL SCIENCE,

PUBLISHED BY THE

FACULTY OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The TIMES will be issued on the first of the months of January, April, July and October of each year—the volume commencing in July.

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SPECIAL NOTICE.

 We are prepared to supply back volumes and numbers of the DENTAL TIMES. Articles sent for publication must be received fifteen days before the day of issue of the Journal, and should be directed to GEO. T. BARKER, 1111 Arch street. Exchanges should be thus directed.

All matters relating to the business management must be directed to T. L. BUCKINGHAM, 1206 Vine street, Philadelphia.

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This College holds three sessions each year. The first session commences October 8th, and continues until the end of January; the second session commences February 1st, and continues until the beginning of May; the third session continues throughout the summer months.

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The attention of Dentists is invited to our **FINE GOLD FOIL**, which is prepared under our constant personal supervision. Our Nos. are 4, 5, 6, and 8.

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AWARDED TO

JOHNSON & LUND,

AT THE

**WORLD'S FAIR IN PRUSSIA,
1865,**

FOR EXCELLENCE IN THE MANUFACTURE OF ARTIFICIAL TEETH.

The attention of Dentists is called to our late patterns of

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In claiming for them

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We are endorsed by all who have given them a trial, as well as by the fact that we have just received a PRIZE MEDAL at the World's Fair in Prussia, for excellence in the manufacture of Artificial Teeth.

Our assortment of Block Teeth for Rubber Base is quite varied.

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Blocks or Sections for Rubber Base,.....	20 cents.
Single Gum Teeth, " ".....	20 "
" " Plate Work,.....	20 "
Plain Teeth, for Plate Work,.....	10 "
" " for Rubber Work,.....	10 "
Pivot Teeth,.....	8 "

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A Liberal Discount made to Wholesale Dealers.

JOHNSON & LUND.

ESTABLISHED
1837.

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ESTABLISHED
1837.

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SURGICAL AND DENTAL INSTRUMENTS &C.

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Assiduous attention to the details of the business, which an experience of thirty years has afforded, has enabled him to make many improvements in his

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Both as regards their quality and adaptation to the purposes for which they are intended, a desideratum which will be appreciated by all wishing to purchase Instruments, that are reliable and of long and well established reputation.

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Atomizers,
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 Catalogues furnished on application.

jy'69—1y

Chevalier's Dental Depot,

PERMANENTLY ESTABLISHED AT

925 BROADWAY, NEW YORK.

In my former advertisements I offered the profession a discount of fifteen per cent. on all bills exceeding a certain amount, which has met with such opposition from all the dealers in Dental Materials, that they, in consequence, refused to allow me the usual trade discount on such articles as I had to purchase from them. I am, therefore, constrained to withdraw my offer. I will, however, *continue to make a discount of fifteen per cent.* on all *Dental Instruments* made by my father, JOHN D. CHEVALIER, the celebrated manufacturer, on bills of *Twenty Dollars* and upwards, at the prices quoted in the Catalogue of the old firm of JOHN D. CHEVALIER & SON, except on the following articles, the prices of which are *net*:
 Chevalier's Finest Octagon Forceps, warranted for one year, each, - \$2 50
 " Excavators, Burrs & Drills, with octagon steel handles, per doz. 1 50

REPAIRING.

You have undoubtedly many instruments, such as BURRS, EXCAVATORS and PLUGGERS, which have been thrown aside as useless; many of these can be altered or repaired. Any old forcep, that is not broken at the joints, can be repaired and made as *good as new*, and the altering or repairing includes polishing. When sending instruments to be repaired, prepay the expressage, and as soon as the work is finished it will be returned to you with the bill to collect on delivery.

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Repairing or Altering Forceps,	-	-	-	each,	75 cents.
" Excavators, Burrs & Drills, with Steel Handles,	"	"	"	"	5 "
" or Altering Pluggers,	"	"	"	"	20 "
" " " with Ivory or Ebony	"	"	"	"	30 "
" " " Pearl or Cameo	"	"	"	"	40 "
Polishing Forceps,	-	-	-	"	25 "
" Pluggers and Scalers, with Steel Handles,	"	"	"	"	10 "
" " " Ivory or Ebony Handles,	"	"	"	"	15 "
" " " Pearl or Cameo	"	"	"	"	25 "

And all other repairing proportionally low.

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I keep on hand a fine assortment of H. D. JUSTI & CO.'S celebrated Rubber and Plate Teeth. These teeth are so well and favorably known to the profession, that it is needless to offer any further recommendation for them. They are the best and cheapest in the market, the following being the prices:

GUM TEETH, Rubber and Plate, - - - each 15 cents.
PLAIN " " " " - - - " 10 "

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Rubber, Brush Wheels, Collodion, Impression Cups, Rubber Scrapers, Burrs to Chevalier's Standard and United States Lathes, and every other article required by the profession always on hand. All orders carefully filled and promptly dispatched
 By the Profession's very Obedient,

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925 Broadway, New York.

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Manufactured by the Proprietor, Albany, N. Y.

The adoption of a strictly cash business, (resulting in a saving of nearly one-third,) with improved facilities in the manufacture, enables me to put these metals at the following greatly reduced rates:

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PLASTIC FUSIBLE METAL.—For RUBBER SOLDER, Mechanical Dentistry, &c.—(*Patented March 20, 1860.*)—\$1 an ounce; put up in 1 oz. and $\frac{1}{2}$ oz. ingots. This is not intended for filling teeth, requiring too high a heat, &c; it is designated from the "Filling" by the patent mark, bearing only the date "March 20, 1860."

[The above metals contain no mercury, and hence may be safely used in connection with metal plates.]

AMALGAMATED FILLING.—\$1 an oz. It contains a small proportion of mercury, and the ingots are accordingly stamped "AMALGAMATED."

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INSTRUMENTS.

Pluggers for using Plastic Material, in sets of 8 and 12, steel handles, best style, at \$2.75 and \$4 a set respectively; for a less number 35 cents a piece. Each instrument is stamped "WOOD'S PATENT, February 28, 1865."

Mercury Gauge, for use in mixing up Amalgam, 25 cents.

Amalgam or Filling Measure, with one cup, 75 cts.; with two cups, \$1.

Postage extra—On material, 9 cts. an ounce; on instruments, 3 cts. each.

For full particulars, and directions for using, send for a circular.

Letters should enclose stamps for return postage. Address,

B. WOOD, M. D., Dentist,

September 1st, 1868.

[jy'69—1y]

ALBANY, NEW YORK.

WALKER'S EXCELSIOR AMALGAM.

A NEW MATERIAL FOR FILLING AND PRESERVING THE TEETH.

This amalgam adapts itself readily to the walls of the cavity, can be easily and rapidly manipulated, does not contract nor oxidize, and becomes exceedingly hard. A few trials with it will demonstrate these claims.

It is economical, compared with other amalgams of less price; an ounce of this will go farther, by one-third, than any other amalgam, as it can be worked longer without losing its plasticity, so that less of it will be wasted in using it. It costs but one cent more on each filling than the cheap, poor articles. It requires less mercury than any other amalgam in use, and becomes harder in a shorter time.

Price, - - - - - \$4.00 per oz.

Prepared by R. WALKER, Dentist,

No. 906 Walnut St., Philadelphia.

N. B.—The superior quality of this amalgam has induced unprincipled men to counterfeit it. A miserable, poor article, claiming to be "WALKER'S EXCELSIOR AMALGAM," has been traced to parties in Brooklyn, N. Y. The *Genuine Amalgam* hereafter will have our Monogram Trade Mark and Signature on the brown envelope inside. [Refuse all others. Buy of responsible parties, or order from the manufacturer.]

jy'69—1y

SAMUEL S. WHITE,
MANUFACTURER OF
PORCELAIN TEETH,
AND IMPORTER AND DEALER IN
DENTISTS' MATERIALS.

PUBLISHER OF THE
DENTAL COSMOS.

Terms, per annum, in advance, \$2.50.

The Volume Commences in January.

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DENTAL CATALOGUE,

Of 226 Pages Octavo, and containing nearly 1000 Illustrations.

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Any Dentist, or Dealer in Dental Goods, who has not already received a copy, can obtain one, free of expense, upon application. Let the name of the Town, County and State, and the name of the applicant, be written distinctly.

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jy'69—1y

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Nos. 247 and 249 Main Street, Buffalo, N. Y.

MANUFACTURERS AND DEALERS IN DENTAL GOODS,

AT WHOLESALE AND RETAIL.

WHITNEY'S VULCANIZERS AND FLASKS



For Alcohol and Gas.



For Kerosene.



Old style.



New Style.

WHITNEY'S VULCANIZER

Is composed of two pieces only, a copper pot, and a brass head that screws on to the pot.

HAYES' VULCANIZING OVENS

Are of copper, of the usual thickness, surrounded with a shell of malleable iron, $\frac{1}{8}$ of an inch thick. The boilers are made with and without the "iron clad" shell.

Pat. Mar. 5, 1861, Apr. 3, 1866.

PRICES.

No. 1 (1 flask) Whitney's or Hayes'	\$15.00
No. 2, (2 flask) " "	16.00
No. 3, (3 flask) " "	17.00
No. 1, (1 flask) iron clad oven, Hayes'	15.00
No. 2, (2 flask) " " "	16.00
No. 2, (2 flask) " boiler, " "	17.00
No. 3, (3 flask) " " "	18.00

Gas, Alcohol, or Hayes' Kerosene Burners, at above prices. Union Kerosene Stove \$1.00 extra.

PRICE OF FLASKS.

Whitney's (malleable iron)	87 $\frac{1}{2}$ cents.
" bolts in sets of 3, ...	18 "
Hayes' flask and clamp complete, ...	87 $\frac{1}{2}$ "
" "	37 $\frac{1}{2}$ "
" clamp, ...	50 "

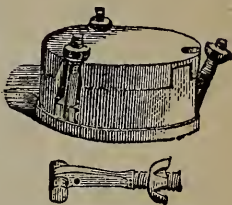
HAYES' VULCANIZERS AND FLASK.



Iron Clad Oven.



Iron Clad Boiler.



SNOW & LEWIS' IMPROVED AUTOMATIC PLUGGER.



Patented Oct. 30, and Nov. 20, 1866.

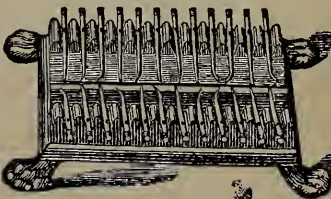
This instrument is the most efficient substitute for the mallet and assistant yet devised. The working parts are all contained in the handle. They can be locked by the ring on the handle, enabling the plugger to be used as a hand instrument. This feature is not presented in any other spring plugger in market.

The Rack is designed to hold the points as represented in the cut, and enable the dentist to change them with one hand when operating. The base is of cast iron, sufficiently heavy to retain its place on the table. It will be found to answer the purpose designed perfectly.

PRICES.

Automatic Plugger, triple gilt, ...	\$14 00
Automatic Plugger, silver plated, ...	10 00
Points, per dozen, ...	3 50
Enamel Chisels, per set of six, ...	1 75
Points in the rough, per dozen, ...	1 50
Point Rack, ...	2 00

Also manufacturers of various other articles. See advertisement next month.



RACK FOR POINTS.

ILLUSTRATED CIRCULARS SENT ON APPLICATION.



ENAMELENE

Prepared from
Dr Barker's Formula

A FIRST-CLASS ARTICLE OF TOOTH POWDER,

Prepared in the very best manner, of the choicest materials; each ingredient being soluble in the saliva, and designed expressly for the daily use of dental patients, our object being to put up a choice article of Tooth Powder that Dentists may confidently recommend to their patrons, that will arrest the accumulation of tartar, prevent decay by neutralizing acids and decomposing food, and at the same time be agreeable in taste, and attractive in appearance. We are prepared to furnish

ENAMELENE

In Glass Jars or Glass Bottles holding one pound; White Glass Boxes, neat Paper Boxes, (round or oval,) and Glass Bottles holding THREE OUNCES, with metal top.

We can also furnish

BEAUTIFUL ILLUMINATED LABELS,

Printed on stone, in three colors, of different sizes, (round or oval.)

The heading of this advertisement is of the size and pattern of Label for large bottles or cans, being identical, except in coloring.

The ENAMELENE is placed at the exceeding low price of

ONE DOLLAR PER POUND,

at which it will be sold in 1, 2, or 4 lb. cans without extra charge for cans.

Glass Bottles, ground stopper, containing one pound,.....	\$1 50
White Enameled Glass Jars or Boxes, with glass covers, 3 inches in diameter by 1¼ inch high, holding two ounces, filled with Enamelene, per dozen,.....	2 50
White Enameled Glass Jars or Boxes, with glass covers, 3 inches in diameter by 1¼ inch high, holding two ounces, unfilled, per dozen,.....	1 50
Octagon Glass Bottles, holding three ounces, with metallic top, (our own pattern,) designed for placing a sufficient quantity of powder on the brush without opening the bottle, thereby retaining the perfume and facilitating the use of the article, per dozen,.....	5 00
Octagon Glass Bottles, with our own metallic top, with labels, unfilled, per dozen,.....	2 40
Neat Round or Oval Paper Boxes, fancy colors, filled, per dozen,.....	1 50
Oval Paper Boxes, unfilled, per dozen,.....	75
Round Paper Boxes, unfilled, per dozen,.....	60
Illuminated Labels, (oval or round,) to fit boxes or jars, per hundred,.....	1 00

 Liberal Discount to the Trade. Sample sent free on application.

RUBENCAME & BARKER, 825 Arch St., Phila., Pa.

We have made arrangements and are prepared to perform for the profession

ALL KINDS OF MECHANICAL WORK

that may be intrusted to our care, in the best manner. It will be returned with dispatch, and satisfaction guaranteed.

 Price List sent on application to

RUBENCAME & BARKER.

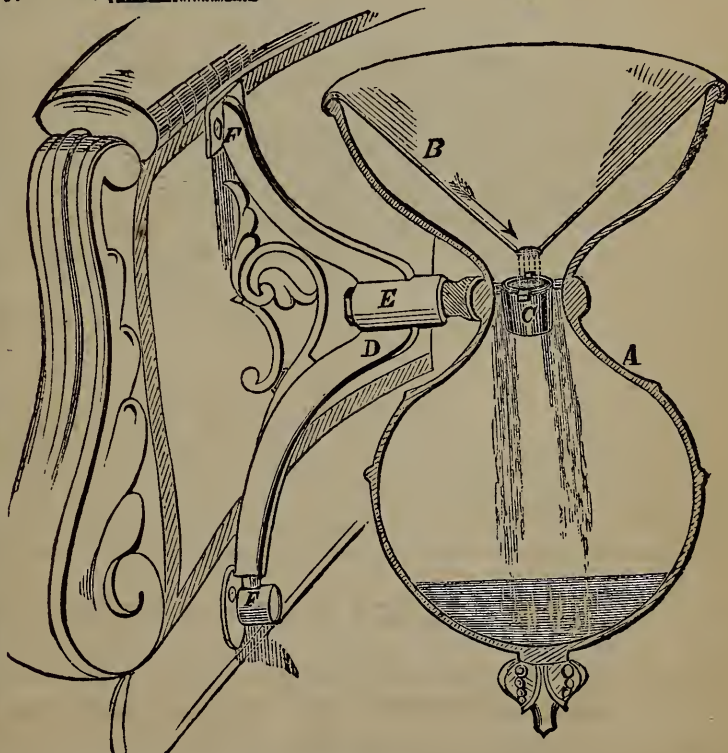
RUBENCAME & BARKER

OFFER FOR SALE

BUTLER'S DENTAL SPITTOON.

DESCRIPTION OF SPITTOON.

B is the bowl of spittoon, venting immediately over the amalgamating cup C.
 A is the receptacle for the secretions, after they flow into and over the amalgamating cup.
 C is the amalgamating cup, into which the secretions, gold cuttings and filings flow; the gold all being retained by the mercury in the cup, and the secretions flowing over the top and into the bowl A.
 D is a metal bracket supporting the spittoon, and fastened to the chair by means of plates and the screws, at F.
 E is a universal joint, allowing the spittoon to keep an upright position at all times, even when the chair is thrown out of its perpendicular by the operator.
 The entire spittoon is made wholly of metal, either bronzed or plated, and otherwise handsomely embellished.



PRICE LIST OF SPITTOON:

Silver Plated Spittoon,	\$30.
Bronzed Spittoon, with Silver-plated Bowl,	20.

This Spittoon can be as readily attached to any other Chair.

RUBENCAME & BARKER,
825 ARCH STREET, PHILADELPHIA, PA.

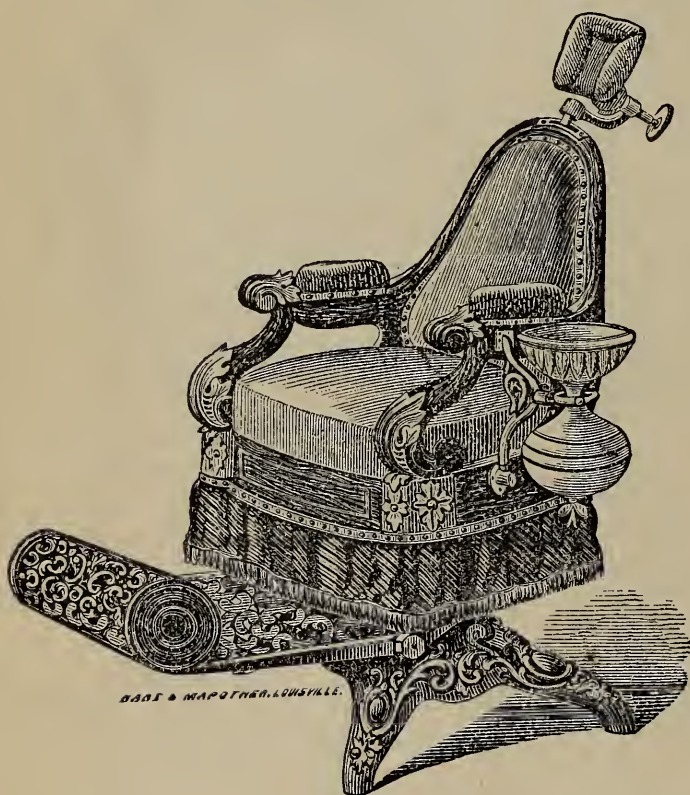
OFFER FOR SALE

DR. WM. M. BUTLER'S

I. X. L.

UNIVERSAL DENTAL CHAIR,

To which they would ask especial attention.



PRICE LIST OF CHAIR.

Solid Rosewood Chair, carved arms, oiled or varnished, full plated, with all the movements,	\$200
Solid Black Walnut Chair, carved arms, oiled or varnished, full plated, with all the movements,	\$180
Solid Black Walnut Chair, moulded arms, oiled or varnished, half plated, with all the movements except the raising of the body,	\$140
Solid Black Walnut Chair, moulded arms, oiled or varnished, backward and forward movement, elevation of the seat and footstool attached, finished in the same style as the cut,	\$ 90

DESCRIPTION OF CHAIR.

This Chair has all the advantages and movements of the Ball and Socket, without any of its defects and complications. It has a backward and forward movement of °60, a lateral movement of °40, (combined or separate,) and is operated by pressing the foot on two levers projecting from the base, each only moving $\frac{1}{2}$ of an inch, and may be stopped at any point by removing the foot from the levers, as they are self-acting and re-adjust themselves.

The body of the Chair can be raised eight inches, and the seat twelve inches, by the aid of a crank and powerful machinery, with scarcely an effort of the operator; the foot stool also moves up and down by means of a crank, adapting itself to the stature and comfort of the patient, and is a complete novelty of itself, made entirely of metal, handsomely ornamented and needing no carpet or rug.

The head-rest has twelve different movements, each speedily and easily operated, perfectly adapting itself to any position or conformation of head and neck, and far less complicated than any other good head-rest ever known.

The different movements of this Chair are made with only one crank; are entirely noiseless, and a very great and decided superiority it has over all other chairs is, that the operator can work on his patient at the same time that he gives any of the movements to the Chair that he may desire, as it is perfectly balanced with the weight of patient in it. The whole Chair is beautifully finished and decorated, and upholstered in the best style.

RUBENCAME & BARKER,

OFFER FOR SALE

BUTLER'S DENTAL TABLE

DESCRIPTION OF TABLE.

The Table is a very handsome and highly ornamented piece of Dental Furniture, indispensable in the operating room of a first-class dentist. It is made entirely of metal; the top is of an octagonal form, and furnished with eight metallic drawers (working perfectly smooth and easy, and of sufficient capacity to hold all the necessary tools, medicines, dryers, foil, &c., that an operator usually requires,) and four metallic cups. The top, with the drawers, can be raised or lowered ten inches, revolves on its own axis on the sustaining (extension) bracket, which bracket also revolves around the central column: all at the pleasure of the operator. It fully takes the place of the usually cumbersome and expensive Side Case, and is far more convenient, as well as ornamental.

It has also a moveable Annealing Lamp, revolving around the table at the pleasure of the operator, and prepared for burning either gas or alcohol. When required for burning gas, it is supplied by connecting a pipe brought up through the floor on which the table stands, with an attachment furnished in the bottom of the supporting column and bracket into the lamp. A suitable attachment is also provided for burning alcohol, thus allowing the operator to use either, as circumstances or convenience may dictate.



PRICE LIST OF TABLE.

Japanned and gilt column, with silver-plated bracket and top, with Annealing Lamp for gas or alcohol,	\$60
Japanned and gilt column, with bronzed bracket and top, with Annealing Lamp for gas or alcohol,	\$50
Japanned and gilt column, with silver-plated bracket and top, without Annealing Lamp,	\$55
Japanned and gilt column, with bronzed bracket and top, without Annealing Lamp,	\$45

WE HAVE ON HAND A FULL ASSORTMENT OF

DR. BUTLER'S UNEXCELLED

EXCAVATORS, BURR DRILLS AND FORCEPS.

We can give them our unqualified recommendation. DENTAL FURNITURE will be sold and payment received in monthly or quarterly installments, when desired.

RUBENCAME & BARKER,

SUCCESSORS TO

Philadelphia Dental Manufacturing Co.,

DEPOT: 825 ARCH STREET,

PHILADELPHIA, PA.

Having purchased the entire interest and stock of Dental Goods and manufacturing facilities of the Philadelphia Dental Manufacturing Company, we invite the attention of the Profession to our

LARGE AND VARIED ASSORTMENT OF

ARTIFICIAL TEETH,

AND EVERY VARIETY OF

Dental Goods for Office or Laboratory Use.

RETAIL PRICES:

GUM TEETH, 16 CENTS EACH.

When ordered by the quantity, we will furnish them at the following prices for *cash only*:—

For \$25.00, 12 sets of 14 Gum Teeth, (168,) being a fraction less than 15c. each.

For \$50.00, 26 sets of 14 Gum Teeth, (364,) being a fraction less than 14c. each.

For \$100.00, 55 sets of 14 Gum Teeth, (770,) being a fraction less than 13c. each.

PLAIN TEETH, 10 CENTS EACH.

For \$25.00, 20 sets of 14 Plain Teeth, (280,) being a fraction less than 9c. each.

For \$50.00, 42 sets of 14 Plain Teeth, (588,) being a fraction over 8½c. each.

For \$100.00, 89 sets of 14 Plain Teeth, (1,246,) being a fraction over 8c. each.

Assorted samples of Teeth will be furnished by mail, free of charge. These will enable the Dentist to decide as to the pattern best suited to any particular case, which can be ordered by the number on the back of sample.

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Vol. VII.

APRIL, 1870.

No. 4.

THE
DENTAL TIMES,

A Quarterly Journal of Dental Science.

EDITED AND PUBLISHED BY

THE FACULTY

OF THE

Pennsylvania College of Dental Surgery.

PHILADELPHIA.

PRICE, \$1.00 A YEAR IN ADVANCE.

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THE DENTAL TIMES,

A QUARTERLY JOURNAL OF DENTAL SCIENCE,

PUBLISHED BY THE

FACULTY OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The TIMES will be issued on the first of the months of January, April, July and October of each year—the volume commencing in July.

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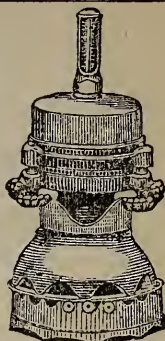
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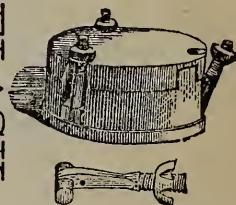
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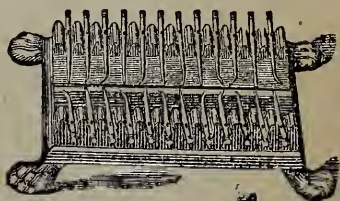
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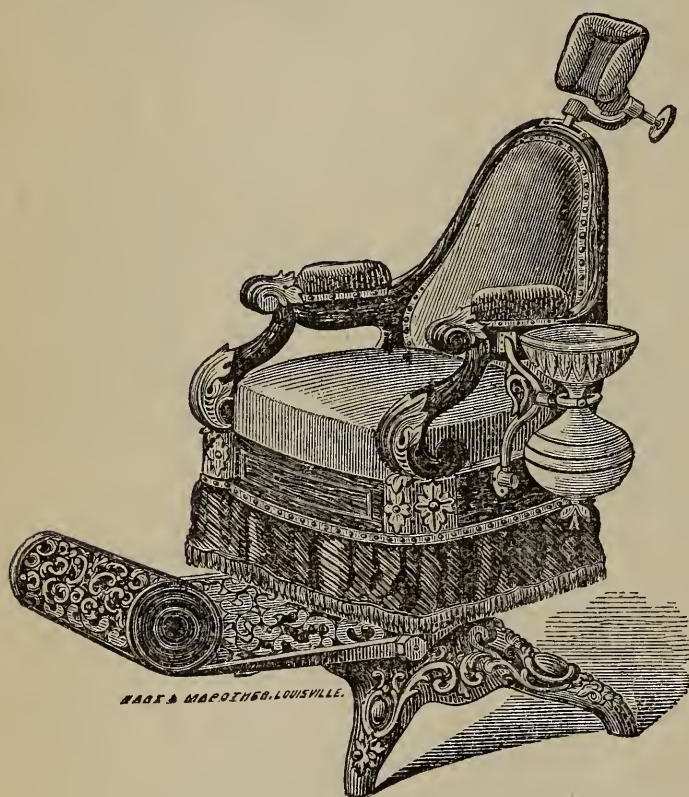
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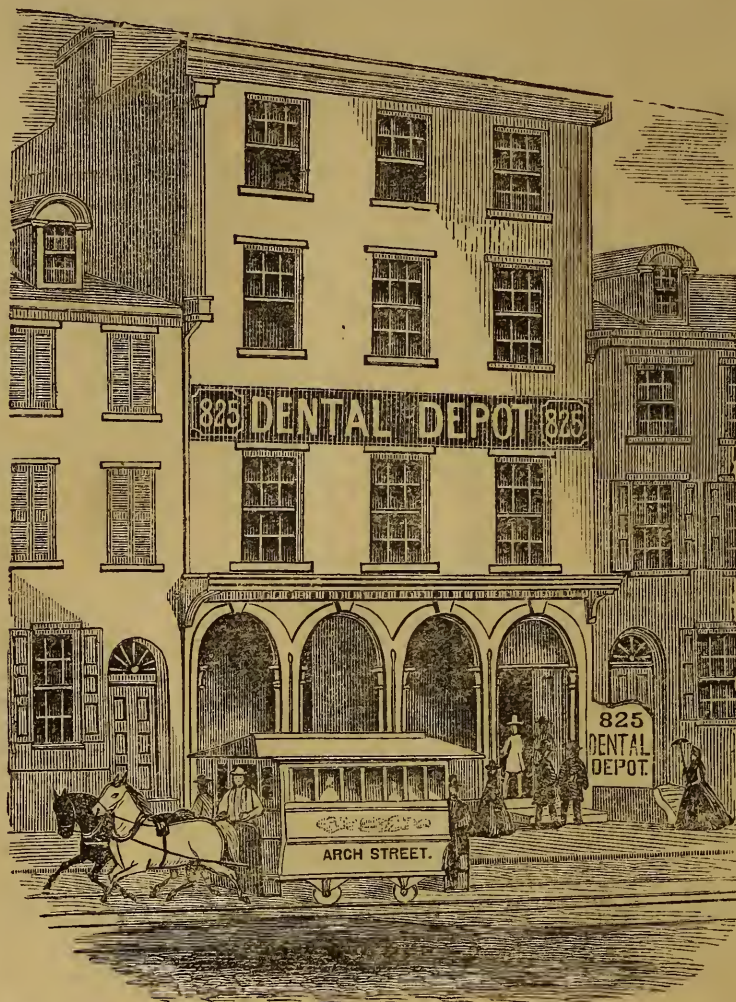
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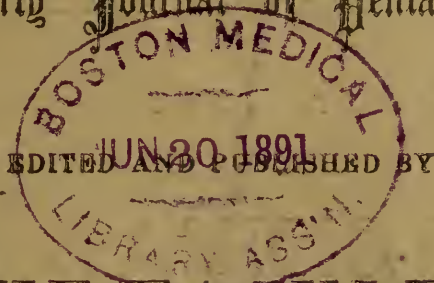
Vol. VIII.

JULY, 1870.

No. 1.

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This Journal was established in Richmond, Va., January, 1866, and has now reached its Tenth Volume. It was removed to Louisville, Ky., by the invitation of the Kentucky State Medical Society, May, 1868.

It contains more matter, for the price of subscription, (five dollars in paper currency, annually,) than was ever published in this country, previously to the war, for five dollars annually in gold. In addition to this inducement to subscribers, each number contains a lithographic engraving of some distinguished member of the European or American medical profession. These engravings (or photographic likenesses of the same persons) cannot be purchased for less than twenty-five cents each; the twelve engravings thus issued in the Journal amount in value to fully three dollars annually. The cost of the Journal proper is thus reduced to two dollars in currency, or less than half of the price charged (in gold) for a less amount of reading matter before the war.

The subscription list has been more than doubled in the past sixteen months, and is constantly increasing. The associate editors and contributors represent the most accomplished writers and practitioners in America. The subscribers to this Journal have always contributed largely to its pages, and it is hoped that this agreeable feature of the Journal will always be manifest. Subscribers are particularly invited to contribute. None of the attractive promises usually made in annual announcements will be made here, but the patrons of the Journal are assured that no expense possible, no labor or care, will be spared to make the Journal a welcome and useful visitor to its supporters.

The engravings for the present year are as follows: Sir Jas. Simpson, Baron Liebig, Sir William Fergusson, C. Virchow, Dupuytren, Rokitsansky, Trousseau, Chelius, Civiale, Thomas King Chambers, Ricord, and Claude Bernard.

Subscribers are earnestly asked to aid in developing the material of the Journal, and to induce their friends to contribute, both by purse and pen, to its support.

The editor returns his earnest thanks to the friends and patrons of the Journal, and asks a continuance of their kindness and support.

Letters should be addressed to him at
july,'70-1y

LOUISVILLE, KENTUCKY.

ARTIFICIAL TEETH.



PRIZE MEDAL

AWARDED TO

JOHNSON & LUND,

AT THE

**WORLD'S FAIR IN PRUSSIA,
1865,**

FOR EXCELLENCE IN THE MANUFACTURE OF ARTIFICIAL TEETH.

The attention of Dentists is called to our late patterns of

BLOCK TEETH FOR RUBBER BASE.

In claiming for them

BEAUTY, NATURAL APPEARANCE & TOUGHNESS,

We are endorsed by all who have given them a trial, as well as by the fact that we have just received a PRIZE MEDAL at the World's Fair in Prussia, for excellence in the manufacture of Artificial Teeth

Our assortment of Block Teeth for Rubber Base is quite varied.

PRICES.

Blocks or Sections for Rubber Base,.....	20 cents.
Single Gum Teeth, " ".....	20 "
" " Plate Work,.....	20 "
Plain Teeth, for Plate Work,.....	10 "
" " for Rubber Work,.....	10 "
Pivot Teeth,.....	8 "

NOTICE.

Our Teeth for Rubber Work have DOUBLE-HEADED PINS. These are distinct and well formed. One of them is really inserted in the tooth, the other is at the extremity of the pin, OUTSIDE. We thus secure a firm resistance in the body of the tooth, and ample space for the retention of the rubber around the pin outside. Our customers pronounce them *Excelsior.*"

A Liberal Discount made to Wholesale Dealers.

JOHNSON & LUND.

ESTABLISHED
1837.

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ESTABLISHED
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All orders entrusted to his care will be promptly attended to.

HORATIO G. KERN,

No. 25 North Sixth St., Philadelphia.

CONSTANTLY ON HAND

DENTAL LATHES, (Various Kinds.)

Vulcanizers,

Dental Files,

Impression Cups,

Excavators,

Foil Shears,

Atomizers,

Rubber Files,

File Carriers,

Bur Drills,

Plate Shears.

SLIDING NERVE SOCKETS AND BITS.

PORCELAIN TEETH AND DENTISTS' MATERIALS.

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Chevalier's Finest Octagon Forceps, warranted for one year, each, - \$2 50
" Excavators, Burrs & Drills, with octagon steel handles, per doz. 1 50

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" or Altering Pluggers,	"	"	"	"	20 "
" " " with Ivory or Ebony	"	"	"	"	30 "
" " " " Pearl or Cameo	"	"	"	"	40 "
Polishing Forceps,	-	-	-	-	25 "
" Pluggers and Scalers, with Steel Handles,	"	"	"	"	10 "
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PLAIN " " " " - - - " 10 "

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This well-known Lathe is still before the profession, and has been reduced in price to *Twenty-one* dollars, making it the *cheapest* as well as the *best* Lathe in the market. Boxing and cartage extra.

SUNDRIES.

Rubber, Brush Wheels, Collodion, Impression Cups, Rubber Scrapers, Burrs to Chevalier's Standard and United States Lathes, and every other article required by the profession always on hand. All orders carefully filled and promptly dispatched
By the Profession's very Obedient,

JOHN D. CHEVALIER, Jr.,

Manufactory, 120 William St.

925 Broadway, New York.

CHARLES ABBEY & SONS,

MANUFACTURERS OF

DENTISTS' FINE GOLD AND TIN FOIL,

NOS. 228 & 230 PEAR STREET,

PHILADELPHIA.

The attention of Dentists is invited to our **FINE GOLD FOIL**, which is prepared under our constant personal supervision. Our Nos. are 4, 5, 6, and 8.

We are also manufacturing an **ADHESIVE FINE GOLD FOIL**, Nos. 4, 5 and 6.

ALL our Gold Foil is manufactured from **ABSOLUTELY PURE GOLD**, prepared expressly for the purpose, with great care, by ourselves.

DENTISTS' REFINED TIN FOIL CONSTANTLY ON HAND

Address

CHARLES ABBEY & SONS,

jy'69—1y

Philadelphia

WALKER'S EXCELSIOR AMALGAM.

A NEW MATERIAL FOR FILLING AND PRESERVING THE TEETH.

This amalgam adapts itself readily to the walls of the cavity, can be easily and rapidly manipulated, does not contract nor oxidize, and becomes exceedingly hard. A few trials with it will demonstrate these claims.

It is economical, compared with other amalgams of less price; an ounce of this will go farther, by one-third, than any other amalgam, as it can be worked longer without losing its plasticity, so that less of it will be wasted in using it. It costs but one cent more on each filling than the cheap, poor articles. It requires less mercury than any other amalgam in use, and becomes harder in a shorter time.

Price, - - - - - - \$4.00 per oz.

Prepared by R. WALKER, Dentist,

No. 906 Walnut St., Philadelphia.

N. B.—The superior quality of this amalgam has induced unprincipled men to counterfeit it. A miserable, poor article, claiming to be "WALKER'S EXCELSIOR AMALGAM," has been traced to parties in Brooklyn, N. Y. The *Genuine Amalgam* hereafter will have our Monogram Trade Mark and Signature on the brown envelope inside. [Refuse all others. Buy of responsible parties or order from the manufacturer.]

jy'69—1y



ARTIFICIAL TEETH.

A GOLD MEDAL,
THE FIRST PREMIUM, AWARDED at the PARIS EXPOSITION.

MORE PREMIUMS!

AT THE FAIR of the AMERICAN INSTITUTE, NEW YORK, OCTOBER, 1869,
THE FIRST PREMIUM,

A MEDAL & DIPLOMA,

Was Awarded to us for Improvement in Artificial Teeth.

A GOLD MEDAL

Was Awarded to us by the FAIR of the MARYLAND INSTITUTE, BALTIMORE,
Exhibition of November, 1869,

FOR THE BEST ARTIFICIAL TEETH.

These Premiums were awarded for Improvements over all Teeth previously made, either by ourselves or others, and not merely for superiority over those with which they were in competition at the fairs.

The especial attention of the profession is requested to these Improvements, which were recognized by very able Committees as obviating the greatest remaining defects in Artificial Teeth for Rubber Work.

Of this Improvement the Committee of the American Institute say:

"In regard to the shape and insertion of the pin in the body of the teeth now manufactured by S. S. White, the improvement is manifestly great over those of any other manufacturer known to us."

SAMUEL S. WHITE,

PHILADELPHIA, NEW YORK, BOSTON, and CHICAGO.

BUFFALO DENTAL MANUFACTURING COMPANY,

Nos. 247 and 249 Main Street, Buffalo, N. Y.

MANUFACTURERS AND DEALERS IN DENTAL GOODS,

AT WHOLESALE AND RETAIL.

For Alcohol and Gas.



For Kerosene.



Old style.



New Style.

WHITNEY'S VULCANIZERS AND FLASKS

WHITNEY'S VULCANIZER

Is composed of two pieces only, a copper pot, and a brass head that screws on to the pot.

HAYES' VULCANIZING OVENS

Are of copper, of the usual thickness, surrounded with a shell of malleable iron, $\frac{1}{8}$ of an inch thick. The boilers are made with and without the "iron clad" shell.

Pat. Mar. 5, 1861, Apr. 3, 1866.

PRICES.

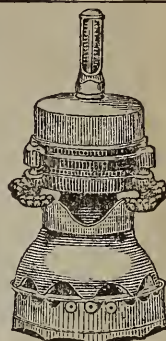
No. 1, (1 flask) Whitney's or Hayes'		\$15.00
No. 2, (2 flask) " " "		16.00
No. 3, (3 flask) " " "		17.00
No. 1, (1 flask) iron clad oven, Hayes'		15.00
No. 2, (2 flask) " " "		16.00
No. 2, (2 flask) " boiler, "		17.00
No. 3, (3 flask) " " "		18.00

Gas, Alcohol, or Hayes' Kerosene Burners, at above prices. Union Kerosene Stove \$1.00 extra.

PRICE OF FLASKS.

Whitney's (malleable iron)	87 $\frac{1}{2}$ cents.
" bolts in sets of 3, ...	18 "
Hayes' flask and clamp complete, ...	87 $\frac{1}{2}$ "
" "	37 $\frac{1}{2}$ "
" clamp, ...	50 "

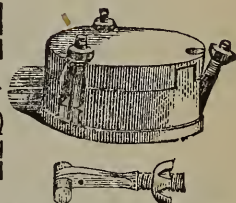
HAYES' VULCANIZERS AND FLASKS.



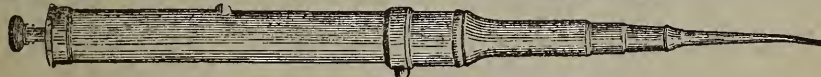
Iron Clad Oven.



Iron Clad Boiler.



SNOW & LEWIS' IMPROVED AUTOMATIC PLUGGER.



Patented Oct. 30, and Nov. 20, 1866.

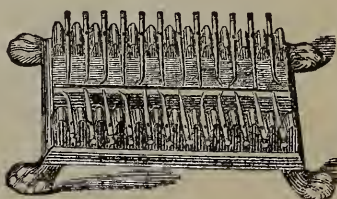
This instrument is the most efficient substitute for the mallet and assistant yet devised. The working parts are all contained in the handle. They can be locked by the ring on the handle, enabling the plugger to be used as a hand instrument. This feature is not presented in any other spring plugger in market.

The Rack is designed to hold the points as represented in the cut, and enable the dentist to change them with one hand when operating. The base is of cast iron, sufficiently heavy to retain its place on the table. It will be found to answer the purpose designed perfectly.

PRICES.

Automatic Plugger, triple gilt, ...	\$14 00
Automatic Plugger, silver plated, ...	10 00
Points, per dozen, ...	3 50
Enamel Chisels, per set of six, ...	1 75
Points in the rough, per dozen, ...	1 50
Point Rack, ...	2 00

Also manufacturers of various other articles. See advertisement next month.



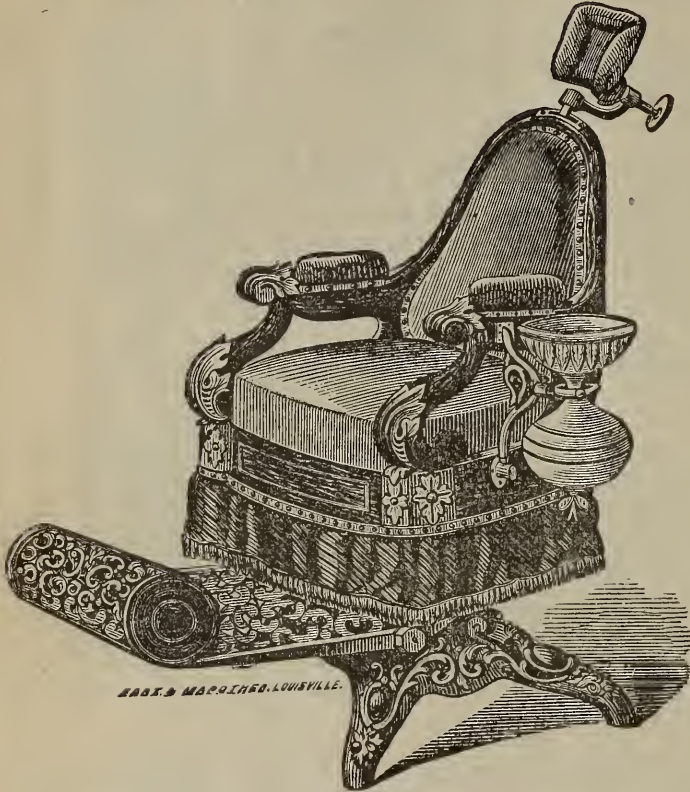
RACK FOR POINTS.

ILLUSTRATED CIRCULARS SENT ON APPLICATION.

RUBENCAME & BARKER,

825 ARCH STREET, PHILADELPHIA, PA.

Butler's Universal Dental Chair.



MADE IN LOUISVILLE, KY.

PRICE LIST OF CHAIR.

Solid Rosewood Chair, carved arms, oiled or varnished, full plated, with all the movements,	\$200
Solid Black Walnut Chair, carved arms, oiled or varnished, full plated, with all the movements,	\$180
Solid Black Walnut Chair, moulded arms, oiled or varnished, half plated, with all the movements except the raising of the body,	\$140
Solid Black Walnut Chair, moulded arms, oiled or varnished, backward and forward movement, elevation of the seat and footstool attached, finished in the same style as the cut,	\$ 90

RUBENCAME & BARKER'S

ANCHOR GOLD FOIL.

BEAUTY

ADHESIVENESS

DUCTILITY

PURITY

PRICE, Nos. 4 to 120, \$4.50 per $\frac{1}{8}$ ounce.



ENAMELENE

Prepared from
Dr Barker's Formula.

A FIRST-CLASS ARTICLE OF TOOTH POWDER,

Prepared in the very best manner, of the choicest materials; each ingredient being soluble in the saliva, and designed expressly for the daily use of dental patients, our object being to put up a choice article of Tooth Powder that Dentists may confidently recommend to their patrons, that will arrest the accumulation of tartar, prevent decay by neutralizing acids and decomposing food, and at the same time be agreeable in taste, and attractive in appearance. We are prepared to furnish

ENAMELENE

In Glass Jars or Glass Bottles holding one pound; White Glass Boxes, neat Paper Boxes, (round or oval,) and Glass Bottles holding THREE OUNCES, with metal top.

We can also furnish

BEAUTIFUL ILLUMINATED LABELS,

Printed on stone, in three colors, of different sizes, (round or oval.)

The heading of this advertisement is of the size and pattern of Label for large bottles or cans, being identical, except in coloring.

The ENAMELENE is placed at the exceeding low price of

ONE DOLLAR PER POUND,

at which it will be sold in 1, 2, or 4 lb. cans without extra charge for cans.

Glass Bottles, ground stopper, containing one pound,.....	\$1 50
White Enameled Glass Jars or Boxes, with glass covers, 3 inches in diameter by 1¼ inch high, holding two ounces, filled with Enamelene, per dozen,.....	2 50
White Enameled Glass Jars or Boxes, with glass covers, 3 inches in diameter by 1¼ inch high, holding two ounces, unfilled, per dozen,.....	1 50
Octagon Glass Bottles, holding three ounces, with metallic top, (our own pattern,) designed for placing a sufficient quantity of powder on the brush without opening the bottle, thereby retaining the perfume and facilitating the use of the article, per dozen,.....	5 00
Octagon Glass Bottles, with our own metallic top, with labels, unfilled, per dozen,.....	2 40
Neat Round or Oval Paper Boxes, fancy colors, filled, per dozen,.....	1 50
Oval Paper Boxes, unfilled, per dozen,.....	75
Round Paper Boxes, unfilled, per dozen,.....	60
Illuminated Labels, (oval or round,) to fit boxes or jars, per hundred,.....	1 00

 Liberal Discount to the Trade. Sample sent free on application.

RUBENCAME & BARKER, 825 Arch St., Phila., Pa.

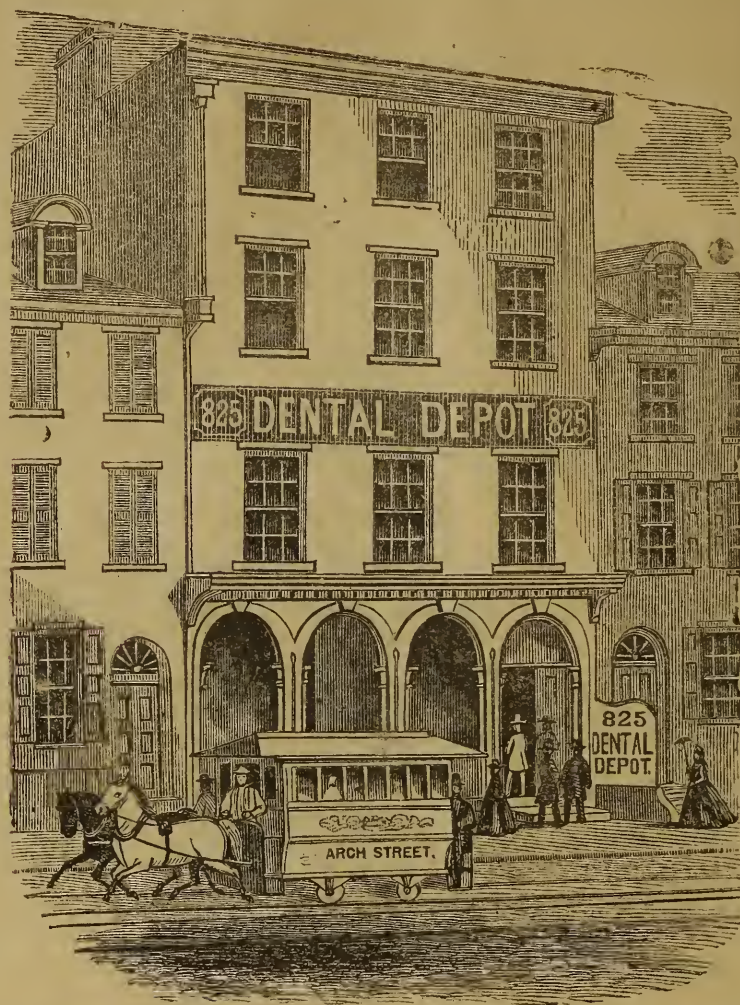
We have made arrangements and are prepared to perform for the profession

ALL KINDS OF MECHANICAL WORK

that may be intrusted to our care, in the best manner. It will be returned with dispatch, and satisfaction guaranteed.

 Price List sent on application to

RUBENCAME & BARKER.



RUBENCAME & BARKER,
DENTAL MANUFACTURERS,

DEPOT: 825 ARCH STREET,
 PHILADELPHIA, PA.

GOLD FOIL,

ANCHOR SECTIONS,

Anchor Flasks,

ENAMELING

GASOMETERS,

Dental Furniture,

INSTRUMENTS

LATHES,

AND EVERY VARIETY OF
 Dental Goods for Office or Laboratory Use.

Vol. VIII.

OCTOBER, 1870.

No. 2.

THE



DENTAL TIMES,

A Quarterly Journal of Dental Science.

EDITED AND PUBLISHED BY

THE FACULTY

OF THE

Pennsylvania College of Dental Surgery.

GEO. T. BARKER, D. D. S., Managing Editor.

PHILADELPHIA.

PRICE, \$1.00 A YEAR IN ADVANCE.

SINGLE COPIES 30 CENTS.

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The TIMES will be issued on the first of the months of January, April, July and October of each year—the volume commencing in July.

TERMS OF SUBSCRIPTION:

One Year, in advance, - \$1 00. | Single Copies, - - 30 Cents.

ADVERTISEMENTS RECEIVED AT FOLLOWING RATES:

One Page, one year,	-	\$25 00.	One Page, one insertion,	\$7 00.
Half Page,	-	13 00.	Half Page,	3 50.
Quarter Page, one year,	-	-	-	\$7 00.

SPECIAL NOTICE.

☞ We are prepared to supply back volumes and numbers of the DENTAL TIMES. Articles sent for publication must be received fifteen days before the day of issue of the Journal, and should be directed to GEO. T. BARKER, 1111 Arch street. Exchanges should be thus directed.

All matters relating to the business management must be directed to T. L. BUCKINGHAM, 1206 Vine street, Philadelphia.

THE RICHMOND AND LOUISVILLE MEDICAL JOURNAL,

"The Largest Medical Monthly in America."

E. S. GAILLARD, M. D.,

Professor of the Principles and Practice of Medicine in the Louisville Medical College; late Professor of General Pathology in the Medical College of Virginia, in the Cumberland University at Nashville, Tenn., and in the Kentucky School of Medicine, etc.,

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Prof. W. H. VAN BUREN, New York.	

This Journal was established in Richmond, Va., January, 1866, and has now reached its Tenth Volume. It was removed to Louisville, Ky., by the invitation of the Kentucky State Medical Society, May, 1868.

It contains more matter, for the price of subscription, (five dollars in paper currency, annually,) than was ever published in this country, previously to the war, for five dollars annually in gold. In addition to this inducement to subscribers, each number contains a lithographic engraving of some distinguished member of the European or American medical profession. These engravings (or photographic likenesses of the same persons) cannot be purchased for less than twenty-five cents each; the twelve engravings thus issued in the Journal amount in value to fully three dollars annually. The cost of the Journal proper is thus reduced to two dollars in currency, or less than half of the price charged (in gold) for a less amount of reading matter before the war.

The subscription list has been more than doubled in the past sixteen months, and is constantly increasing. The associate editors and contributors represent the most accomplished writers and practitioners in America. The subscribers to this Journal have always contributed largely to its pages, and it is hoped that this agreeable feature of the Journal will always be manifest. Subscribers are particularly invited to contribute. None of the attractive promises usually made in annual announcements will be made here, but the patrons of the Journal are assured that no expense possible, no labor or care, will be spared to make the Journal a welcome and useful visitor to its supporters.

The engravings for the present year are as follows: Sir Jas. Simpson, Baron Liebig, Sir William Fergusson, C. Virchow, Dupuytren, Rokitansky, Trousseau, Chelius, Civiale, Thomas King Chambers, Ricord, and Claude Bernard.

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" " " with Ivory or Ebony	"	"	"	"	30 "
" " " " Pearl or Cameo	"	"	"	"	40 "
Polishing Forceps,	-	-	-	-	25 "
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NOS. 228 & 230 PEAR STREET,

PHILADELPHIA.

The attention of Dentists is invited to our **FINE GOLD FOIL**, which is prepared under our constant personal supervision. Our Nos. are **4, 5, 6,** and **8.**

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DENTIST'S GOLD FOIL.

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The Gold is Refined and the Foil manufactured by myself, with every care and attention.

Nos. 4, 5 & 6 CONSTANTLY ON HAND.

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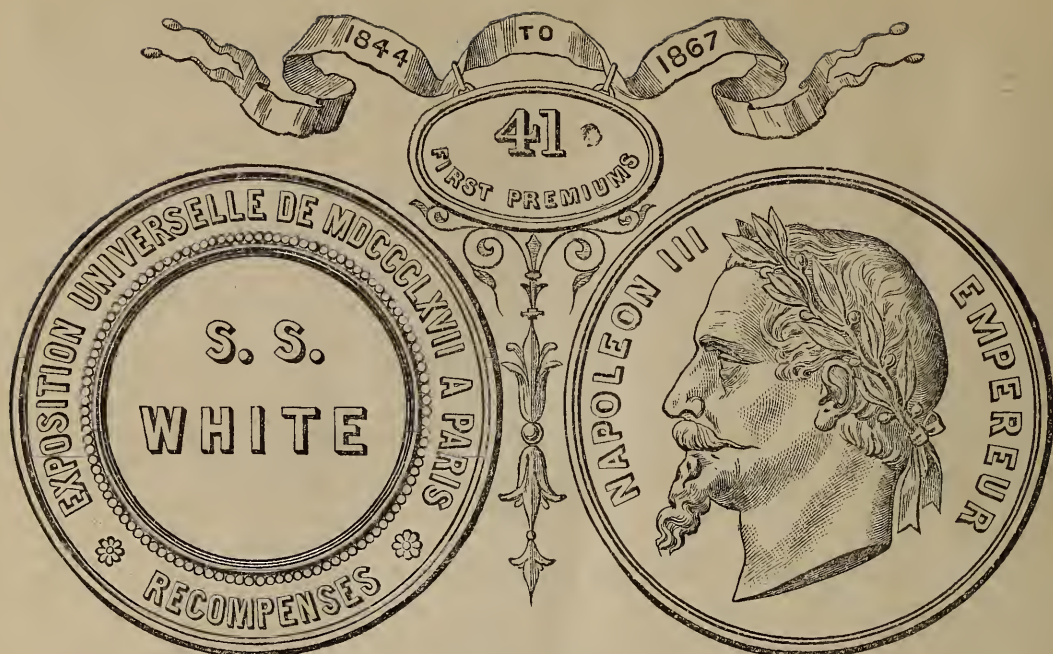
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No. 2 So. Seventh Street,

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AT THE FAIR OF THE AMERICAN INSTITUTE, NEW YORK,

(EXHIBITION OCTOBER, 1869),

THE FIRST PREMIUM

WAS AWARDED TO US FOR

SUPERIOR DENTAL INSTRUMENTS.

AT THE FAIR OF THE MARYLAND INSTITUTE, BALTIMORE,

(EXHIBITION NOVEMBER, 1869),

A GOLD MEDAL

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EXCELLENCE OF DENTAL INSTRUMENTS.

Extract from the Report of the Committee on Instruments of the American Institute.

"We have carefully examined the Dental Instruments exhibited by S. S. White, and find them of superior finish and excellent temper. We would particularly mention the perfection with which the burs and the serrations on the points of the filling instruments are cut: the shapes of the various kinds of filling instruments are admirable. In accordance with the wish expressed by the Board of Managers, we were very particular in testing the temper of these instruments, to ascertain if this important point had been attended to with the same care and skill as were evident in the other parts of their construction, and we found that in this particular their manufacture had been as carefully conducted as in the other parts, and that the instruments had the varieties of temper best suited to the purposes for which they were constructed. And we pronounce them to be the best we have ever seen produced by any manufacturer of Dental Instruments."

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BUFFALO DENTAL MANUFACTURING COMPANY,

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For Kerosene.



Old style.



New Style.

WHITNEY'S VULCANIZERS AND FLASKS

WHITNEY'S VULCANIZER

Is composed of two pieces only, a copper pot, and a brass head that screws on to the pot.

HAYES' VULCANIZING OVENS

Are of copper, of the usual thickness, surrounded with a shell of malleable iron, $\frac{1}{8}$ of an inch thick. The boilers are made with and without the "iron clad" shell.

Pat. Mar. 5, 1861, Apr. 3, 1866.

PRICES.

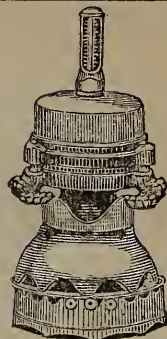
No. 1, (1 flask) Whitney's or Hayes'	\$15.00
No. 2, (2 flask) " "	16.00
No. 3, (3 flask) " "	17.00
No. 1, (1 flask) iron clad oven, Hayes'	15.00
No. 2, (2 flask) " " "	16.00
No. 2, (2 flask) " boiler, " "	17.00
No. 3, (3 flask) " " "	18.00

Gas, Alcohol, or Hayes' Kerosene Burners, at above prices. Union Kerosene Stove \$1.00 extra.

PRICE OF FLASKS.

Whitney's (malleable iron)	87 $\frac{1}{2}$ cents.
" bolts in sets of 3, ...	18 "
Hayes' flask and clamp complete, ...	87 $\frac{1}{2}$ "
" "	37 $\frac{1}{2}$ "
" clamp, ...	50 "

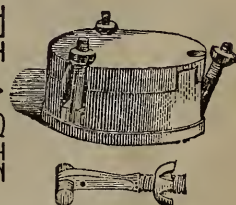
HAYES' VULCANIZERS AND FLASK.



Iron Clad Oven.



Iron Clad Boiler.



SNOW & LEWIS' IMPROVED AUTOMATIC PLUGGER.



Patented Oct. 30, and Nov. 20, 1866.

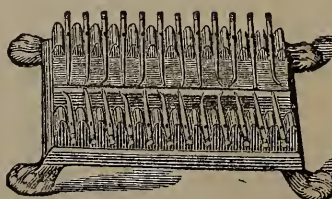
This instrument is the most efficient substitute for the mallet and assistant yet devised. The working parts are all contained in the handle. They can be locked by the ring on the handle, enabling the plugger to be used as a hand instrument. This feature is not presented in any other spring plugger in market.

The Rack is designed to hold the points as represented in the cut, and enable the dentist to change them with one hand when operating. The base is of cast iron, sufficiently heavy to retain its place on the table. It will be found to answer the purpose designed perfectly.

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Automatic Plugger, triple gilt, ...	\$14 00
Automatic Plugger, silver plated, ...	10 00
Points, per dozen, ...	3 50
Enamel Chisels, per set of six, ...	1 75
Points in the rough, per dozen, ...	1 50
Point Rack, ...	2 00

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ILLUSTRATED CIRCULARS SENT ON APPLICATION.

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FINE GOLD FOIL,

Manufactured by **ROBERT M. KERR,**

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FOR SALE BY

RUBENCAME & BARKER.

Price, \$4.50 per $\frac{1}{8}$ ounce.

PURE GOLD FOIL,

FOR DENTISTS,

SEMI-ADHESIVE,

Manufactured by **Hastings & Co.**

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ANCHOR GOLD FOIL.

BEAUTY

ADHESIVENESS

DUCTILITY

PURITY

PRICE, Nos. 4 to 120, \$4.50 per $\frac{1}{8}$ ounce.



A FIRST-CLASS ARTICLE OF Tooth Powder,

Prepared in the very best manner, of the choicest materials; each ingredient being soluble in the saliva, and designed expressly for the daily use of dental patients, our object being to put up a choice article of Tooth Powder that Dentists may confidently recommend to their patrons, that will arrest the accumulation of tartar, prevent decay by neutralizing acids and decomposing food, and at the same time be agreeable in taste, and attractive in appearance. We are prepared to furnish ENAMELENE in Glass Jars

or Glass Bottles holding one pound; White Glass Boxes, neat Paper Boxes, (round or oval,) and Glass Bottles holding THREE OUNCES and TWO OUNCES with metal top.

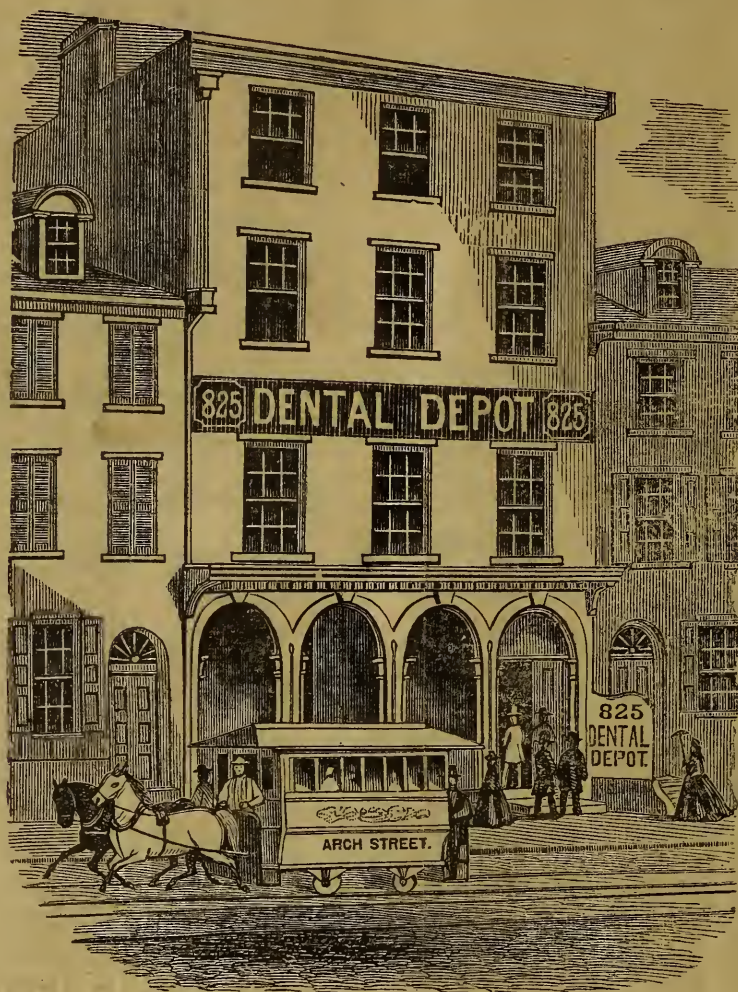
We can also furnish BEAUTIFUL ILLUMINATED LABELS, printed on stone, in three colors, of different sizes, (round or oval.)

The ENAMELENE is placed at the exceedingly low price of ONE DOLLAR PER POUND, at which it will be sold in 1, 2, or 4 pound cans, without extra charge for cans.

Glass Bottles ground stopper, containing one pound,	\$1 50
White Enameled Glass Jars or Boxes, with glass covers, 3 inches in diameter by 1 $\frac{1}{4}$ inch high, holding two ounces, filled with Enamelene, per dozen,	2 50
White Enameled Glass Jars or Boxes, with glass covers, 3 inches in diameter by 1 $\frac{1}{4}$ inch high, holding two ounces, unfilled, per dozen,	1 50
Octagon Glass Bottles, holding three ounces, with metallic top, (our own pattern,) designed for placing a sufficient quantity of powder on the brush without opening the bottle, thereby retaining the perfume and facilitating the use of the article, per dozen,	5 00
Octagon Glass Bottles, with our own metallic top, with labels, unfilled, per dozen,	2 50
Neat Round or Oval Paper Boxes, fancy colors, filled, per dozen,	1 50
Oval Paper Boxes, unfilled, per dozen,	60
Round Paper Boxes, unfilled, per dozen,	60
Illuminated Labels, (oval or round,) to fit boxes or jars, per hundred,	1 00

Liberal Discount to the Trade. Sample sent free on application.

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RUBENCAME & BARKER,
DENTAL MANUFACTURERS.

DEPOT: 825 ARCH STREET,
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GOLD FOIL,

ANCHOR SECTIONS,

Anchor Flasks,

EXTRACTORS,

GASOMETERS,

Dental Furniture,

INSTRUMENTS,

LATHES,

AND EVERY VARIETY OF
 Dental Goods for Office or Laboratory Use.

Vol. VIII.

JANUARY, 1871.

No. 3.

THE
DENTAL TIMES,

A Quarterly Journal of Dental Science.

EDITED AND PUBLISHED BY

THE FACULTY

OF THE

Pennsylvania College of Dental Surgery.

GEO. T. BARKER, D. D. S., Managing Editor.

PHILADELPHIA.

PRICE, \$1.00 A YEAR IN ADVANCE.

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THE DENTAL TIMES,

A QUARTERLY JOURNAL OF DENTAL SCIENCE,

PUBLISHED BY THE

FAULTY OF THE PENNSYLVANIA COLLEGE of DENTAL SURGERY.

The TIMES will be issued on the first of the months of January, April, July and October of each year—the volume commencing in July.

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 We are prepared to supply back volumes and numbers of the DENTAL TIMES. Articles sent for publication must be received fifteen days before the day of issue of the Journal, and should be directed to GEO. T. BARKER, 1111 Arch street. Exchanges should be thus directed.

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ESTABLISHED 1869.

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MANUFACTURER OF

PORCELAIN TEETH,

AND DEALER IN

DENTISTS' MATERIALS,

921 & 923 RIDGE AVENUE,

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The special attention of the profession is requested to our superior quality of Teeth. We venture to say that no other make of Teeth ever attained such popularity in so short a time.

Read what the Profession say.

"I think they are the most beautiful teeth I ever saw."

"I have never used any teeth equal to them. I use them exclusively."

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PRICES.

Gum Teeth,.....	12 cents each.
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Twenty sets or more,.....	1.25 "
Plain Teeth,.....	10 cents each.
Five to twenty sets,....	\$1.30 per set.
Twenty sets or more,.....	1.18 "

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MECHANICAL DENTISTRY.

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The engravings for the present year are as follows: Sir Jas. Simpson, Baron Liebig, Sir William Fergusson, C. Virchow, Dupuytren, Rokitansky, Trousseau, Chelius, Civiale, Thomas King Chambers, Ricord, and Claude Bernard.

Subscribers are earnestly asked to aid in developing the material of the Journal, and to induce their friends to contribute, both by purse and pen, to its support.

The editor returns his earnest thanks to the friends and patrons of the Journal, and asks a continuance of their kindness and support.

Letters should be addressed to him at
july,'70-1y

LOUISVILLE, KENTUCKY.

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PRIZE MEDAL

AWARDED TO

JOHNSON & LUND,

AT THE

**WORLD'S FAIR IN PRUSSIA,
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FOR EXCELLENCE IN THE MANUFACTURE OF ARTIFICIAL TEETH

The attention of Dentists is called to our late patterns of

BLOCK TEETH FOR RUBBER BASE.

In claiming for them

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Single Gum Teeth, " "	20 "
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" " for Rubber Work.....	10 "
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SAMUEL S. WHITE.

oct'69—6mo

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" Excavators, Burrs & Drills, with Steel Handles,	" " "	"	5 "
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" " " with Ivory or Ebony	" " "	"	30 "
" " " Pearl or Cameo	" " "	"	40 "
Polishing Forceps, - - - - -	- - - - -	"	25 "
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THE FIRST PREMIUM, AWARDED at the PARIS EXPOSITION.

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AT THE FAIR of the AMERICAN INSTITUTE, NEW YORK, OCTOBER, 1869,
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Of this Improvement the Committee of the American Institute say:

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MANUFACTURERS AND DEALERS IN DENTAL GOODS,

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For Kerosene.



Old style.



New Style.

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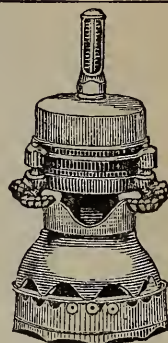
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No. 3, (3 flask) " "	17.00
No. 1, (1 flask) iron clad oven, Hayes'	15.00
No. 2, (2 flask) " " "	16.00
No. 2, (2 flask) " boiler, "	17.00
No. 3, (3 flask) " " "	18.00

Gas, Alcohol, or Hayes' Kerosene Burners, at above prices. Union Kerosene Stove \$1.00 extra.

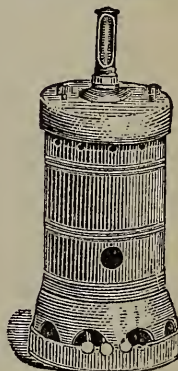
PRICE OF FLASKS.

Whitney's (malleable iron)	87½ cents.
" bolts in sets of 3, ...	18 "
Hayes' flask and clamp complete, ...	87½ "
" "	37½ "
" clamp, ...	50 "

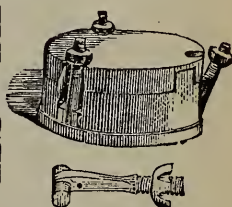
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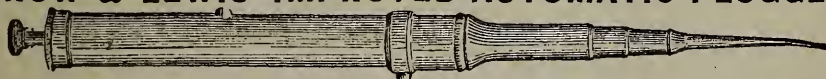
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SNOW & LEWIS' IMPROVED AUTOMATIC PLUGGER.



Patented Oct. 30, and Nov. 20, 1866.

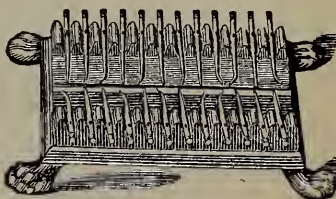
This instrument is the most efficient substitute for the mallet and assistant yet devised. The working parts are all contained in the handle. They can be locked by the ring on the handle, enabling the plugger to be used as a hand instrument. This feature is not presented in any other spring plugger in market.

The Rack is designed to hold the points as represented in the cut, and enable the dentist to change them with one hand when operating. The base is of cast iron, sufficiently heavy to retain its place on the table. It will be found to answer the purpose designed perfectly.

PRICES.

Automatic Plugger, triple gilt, ...	\$14 00
Automatic Plugger, silver plated, ...	10 00
Points, per dozen, ...	3 50
Enamel Chisels, per set of six, ...	1 75
Points in the rough, per dozen, ...	1 50
Point Rack, ...	2 00

Also manufacturers of various other articles. See advertisement next month.



RACK FOR POINTS.

ILLUSTRATED CIRCULARS SENT ON APPLICATION.

THE ODONTOLINA



Is an elegant combination of the bark of the South American soap tree, (*Quillaya Saponaria*), with other cleansing and preserving ingredients,

Delicately Flavored,
and when used as a

MOUTH WASH

imparts a sense of

CLEANLINESS & PURITY.

It is also exceedingly efficient for

Cleansing Artificial Teeth,

and preventing the accumulation of oily and earthy deposits upon the plate. This Wash also contains

**ASTRINGENT & STIMULANT
INGREDIENTS,**

which fits it as an efficient agent for use

After the Extraction of Teeth.

Indeed, no more

HEALING PREPARATION

can be used to reduce inflammatory action in the gum structures.

Paneled arch bottles, holding five ounces, with metallic top, our own pattern, per dozen, \$4.00.

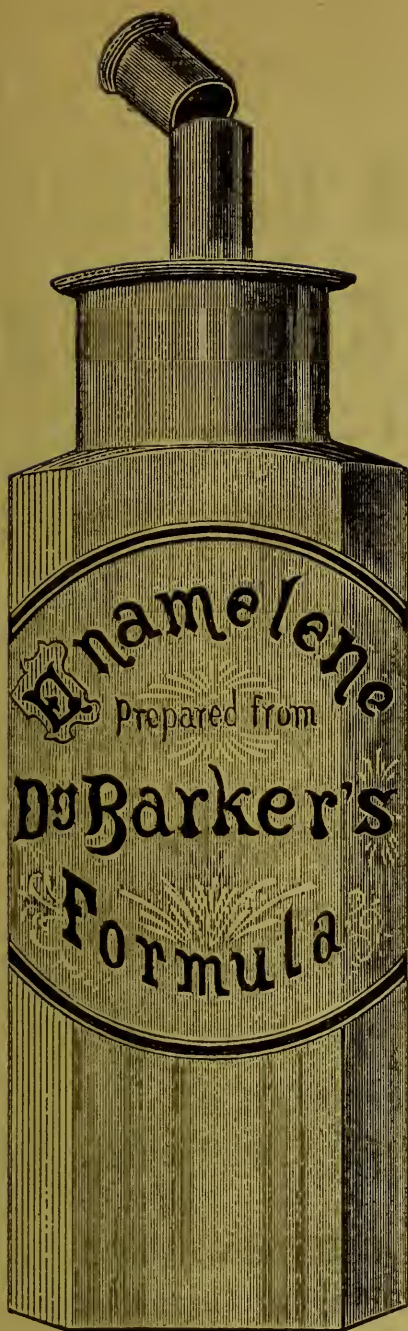
☞ **Discount to Dealers.**

For sale by

RUBENCAME & BARKER,

DENTAL MANUFACTURERS,

825 Arch Street, Philadelphia.



A FIRST-CLASS ARTICLE OF Tooth Powder,

Prepared in the very best manner, of the choicest materials; each ingredient being soluble in the saliva, and designed expressly for the daily use of dental patients, our object being to put up a choice article of Tooth Powder that Dentists may confidently recommend to their patrons, that will arrest the accumulation of tartar, prevent decay by neutralizing acids and decomposing food, and at the same time be agreeable in taste, and attractive in appearance. We are prepared to furnish ENAMELENE in Glass Jars

or Glass Bottles holding one pound; White Glass Boxes, neat Paper Boxes, (round or oval,) and Glass Bottles holding THREE OUNCES and TWO OUNCES with metal top.

We can also furnish BEAUTIFUL ILLUMINATED LABELS, printed on stone, in three colors, of different sizes, (round or oval.)

The ENAMELENE is placed at the exceedingly low price of ONE DOLLAR PER POUND, at which it will be sold in 1, 2, or 4 pound cans, without extra charge for cans.

Glass Bottles ground stopper, containing one pound,.....	\$1 50
White Enameled Glass Jars or Boxes, with glass covers, 3 inches in diameter by 1¼ inch high, holding two ounces, filled with Enamelene, per dozen,.....	2 50
White Enameled Glass Jars or Boxes, with glass covers, 3 inches in diameter by 1¼ inch high, holding two ounces, unfilled, per dozen,.....	1 50
Octagon Glass Bottles, holding three ounces, with metallic top, (our own pattern,) designed for placing a sufficient quantity of powder on the brush without opening the bottle, thereby retaining the perfume and facilitating the use of the article, per dozen,.....	5 00
Round Two Ounce Bottles, with metallic top, as shown in cut, filled, per dozen,.....	3 50
Octagon Glass Bottles, with our own metallic top with labels, unfilled, per dozen,.....	2 50
Neat Round or Oval Paper Boxes, fancy colors, filled, per dozen,.....	1 50
Oval Paper Boxes, unfilled, per dozen,.....	60
Round Paper Boxes, unfilled, per dozen,.....	60
Illuminated Labels, (oval or round,) to fit boxes or jars, per hundred,.....	1 00

Liberal Discount to the Trade. Sample sent free on application.

RUBENCAME & BARKER, 825 Arch St., Phila., Pa.

SEND FOR
RUBENCAME & BARKER'S
ILLUSTRATED CATALOGUE,

CONTAINING A FULL LIST AND DESCRIPTION OF ALL

DENTAL GOODS,

**BESIDES SEVERAL HUNDRED RECIPES FOR
MAKING**

**Solders,
Gold Plates,
Mouth Washes,
Tooth Powders,
Perfumes,
Soaps,
Colognes,
Cements, &c.,**

**And Invaluable Information on Hundreds of Subjects
Relating to Treatment of Morbid Conditions,
of Vital Interest to the Dentist.**

COMPILED BY GEO. T. BARKER, D. D. S.

JUST OUT.

(F Sent gratuitously to all Dentists and Dealers.

RUBENCAME & BARKER,
825 Arch St., Phila.

Vol. VIII.

APRIL, 1871.

No. 4.

THE
DENTAL TIMES,

A Quarterly Journal of Dental Science.

EDITED AND PUBLISHED BY

THE FACULTY

OF THE

Pennsylvania College of Dental Surgery.

E. WILDMAN, M. D., D. D. S., } Managing Editors.
JAMES TYSON, M. D., }

PUBLICATION OFFICE: 1221 SPRUCE STREET,
PHILADELPHIA.

PRICE, \$1.00 A YEAR IN ADVANCE. SINGLE COPIES 30 CENTS.

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THE DENTAL TIMES,

A QUARTERLY JOURNAL OF DENTAL SCIENCE,

PUBLISHED BY THE

FACULTY OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The TIMES is issued on the first of the months of January, April, July and October of each year—the volume commencing in July.

TERMS OF SUBSCRIPTION:

One Year, in advance, - \$1 00. | Single Copies, - - - 30 Cents.

ADVERTISEMENTS RECEIVED AT FOLLOWING RATES:

One Page, one year, -	\$25 00.	One Page, one insertion,	\$7 00.
Half Page, " -	13 00.	Half Page. "	3 50.
Quarter Page, one year, -	-	-	\$7 00.

SPECIAL NOTICE.

 We are prepared to supply back volumes and numbers of the DENTAL TIMES. Articles sent for publication must be received fifteen days before the day of issue of the Journal, and should be directed to JAMES TRUMAN, Secretary, 1221 Spruce street. Exchanges should be thus directed.



DENTAL INSTRUMENTS.

AT THE FAIR OF THE AMERICAN INSTITUTE, NEW YORK,
(EXHIBITION OCTOBER, 1869),

THE FIRST PREMIUM

WAS AWARDED TO US FOR

SUPERIOR DENTAL INSTRUMENTS.

AT THE FAIR OF THE MARYLAND INSTITUTE, BALTIMORE,
(EXHIBITION NOVEMBER, 1869),

A GOLD MEDAL

WAS AWARDED TO US FOR

EXCELLENCE OF DENTAL INSTRUMENTS.

Extract from the Report of the Committee on Instruments of the American Institute.

"We have carefully examined the Dental Instruments exhibited by S. S. White, and find them of superior finish and excellent temper. We would particularly mention the perfection with which the burs and the serrations on the points of the filling instruments are cut: the shapes of the various kinds of filling instruments are admirable. In accordance with the wish expressed by the Board of Managers, we were very particular in testing the temper of these instruments, to ascertain if this important point had been attended to with the same care and skill as were evident in the other parts of their construction, and we found that in this particular their manufacture had been as carefully conducted as in the other parts, and that the instruments had the varieties of temper best suited to the purposes for which they were constructed. And we pronounce them to be the best we have ever seen produced by any manufacturer of Dental Instruments."

SAMUEL S. WHITE,

PHILADELPHIA, NEW YORK, BOSTON, and CHICAGO.

NEW AMALGAM!

A Beautiful and Excellent Preparation for Filling Teeth.

For this new combination of metals (chemically pure) for dental purposes, great superiority is claimed over ordinary Amalgams. It will remain bright for years, and, WHEN USED ACCORDING TO DIRECTIONS, will preserve Teeth more perfectly than any article in use, except gold; and under many circumstances can be successfully used for the permanent preservation of Teeth when gold would prove a failure in the hands of a large majority of operators.

The process of combining and purifying the metals is such as to guarantee comparative freedom from the tarnish of fillings, or discoloration of Teeth, so often observed from the use of ordinary Amalgam. Ten years' experience with it in the hands of some of the most skillful members of the profession has proven its excellence.

The increasing demand for a reliable Amalgam has prompted the introduction of this article, with the confidence that it will give entire satisfaction to those who use it rightly. To manufacture a superior Amalgam, always uniform in quality and texture, at a moderate cost, it is necessary to make it in large lots, and by the aid of machinery. It is also necessary that each lot be thoroughly tested by a competent Dentist before offering it for sale. The inventor has made such arrangements for its manufacture as to enable him to guarantee the reliability of every package.

To meet the wants of different operators, two grades of the New Amalgam were manufactured, (fine and medium coarse.) Hereafter but one grade will be put up, which will consist of the two grades combined, and will only be put up in *quarter*, *half* and *one ounce* packages, with circular of instructions accompanying each, with TRADE MARK of manufacturer on each package and circular.

RETAIL PRICE, per ounce,.....\$4.00.

A Liberal Discount to Dealers.

Manufactured by Dr. B. F. Arrington.

All orders, wholesale or retail, will be filled by the undersigned, at his Depots: Chestnut Street, corner of Twelfth, Philadelphia; 767 and 769 Broadway, corner of Ninth Street, New York; 13 and 16 Tremont Row, Boston; 121 and 123 State Street, Chicago.

SAMUEL S. WHITE.

apl'71-1y

WESTON'S METAL.

This well known and popular Metal has received the highest testimonials from the leading Dentists of the day. *No office license required.* Each package accompanied by instructions. For sale at all depots. Price, 1 lb. package \$6. $\frac{1}{2}$ lb. package \$3. $\frac{1}{4}$ lb. \$2.

WESTON'S NEW METAL.

Plates of this metal worn for seven years, have not the least appearance of decomposition, and are still giving satisfaction to the wearers. As a cheap base for artificial teeth, this metal is applicable to a greater variety of cases than any other material in use. The *sharpest, lightest, thinnest*, strongest and most perfect plate can be made of this, than of any metal in market. It is perfectly tasteless and cleanly. Its adaptability is more accurate than that of any other alloy. It is equally applicable to *upper, under, full and partial* sets, and for temporary cases is far superior to all other bases. Plates for temporary cases can be cast so thin and smooth that ten minutes' work will prepare them for the mouth. Price, 1 lb. packages \$8. $\frac{1}{2}$ lb. package \$4. $\frac{1}{4}$ lb. \$2.

WESTON'S IMPROVED FLASK, THE ONLY APPARATUS REQUIRED.

The simplest, best made, most effective. This flask has received the highest commendations from the profession. It is longer than ordinary flasks, allowing room for a reservoir posterior to the plate. The impure metal or drop, remains in this reservoir and forces the pure metal to form the plate below. It is pronounced by all who use it, the most perfect flask they have ever seen, and by following the simple directions closely, it is all but impossible to fail in casting perfect plates. The new flask is open top and bottom to allow the rapid escape of moisture in drying out; the flask stands on feet and closes with two small bolts and nuts. Price, one dollar. Manufactured and sold by D. WESTON, Towanda, Pa.

*For Sale at RUBENCAME & BARKER'S, and all
the Dental Depots.*

CHARLES J. ESSIG,
Dental Laboratory,

(ESTABLISHED IN 1862.)

**No. 100 NORTH TENTH STREET,
PHILADELPHIA,**

FOR THE MANUFACTURE OF ALL THE BRANCHES OF
MECHANICAL DENTISTRY.

VULCANITE WORK

Executed in the highest style of finish, and promptly returned.

GOLD AND SILVER WORK.

Teeth selected, fitted and soldered upon Gold or Silver Plate.

SECTIONAL RUBBER TEETH

MOUNTED UPON

METALLIC PLATE,

BY

VULCANITE FASTENING,

Finished in the most artistic manner.

Price List and directions for preparing and sending cases sent upon application.

CHARLES J. ESSIG,
No. 100 North Tenth Street, Philadelphia, Pa.

THE RICHMOND AND LOUISVILLE MEDICAL JOURNAL,

"The Largest Medical Monthly in America."

E. S. GAILLARD, M. D.,

Professor of the Principles and Practice of Medicine in the Louisville Medical College; late Professor of General Pathology in the Medical College of Virginia, in the Cumberland University at Nashville, Tenn., and in the Kentucky School of Medicine, etc.,

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This Journal was established in Richmond, Va., January, 1866, and has now reached its Tenth Volume. It was removed to Louisville, Ky., by the invitation of the Kentucky State Medical Society, May, 1868.

It contains more matter, for the price of subscription, (five dollars in paper currency, annually,) than was ever published in this country, previously to the war, for five dollars annually in gold. In addition to this inducement to subscribers, each number contains a lithographic engraving of some distinguished member of the European or American medical profession. These engravings (or photographic likenesses of the same persons) cannot be purchased for less than twenty-five cents each; the twelve engravings thus issued in the Journal amount in value to fully three dollars annually. The cost of the Journal proper is thus reduced to two dollars in currency, or less than half of the price charged (in gold) for a less amount of reading matter before the war.

The subscription list has been more than doubled in the past sixteen months, and is constantly increasing. The associate editors and contributors represent the most accomplished writers and practitioners in America. The subscribers to this Journal have always contributed largely to its pages, and it is hoped that this agreeable feature of the Journal will always be manifest. Subscribers are particularly invited to contribute. None of the attractive promises usually made in annual announcements will be made here, but the patrons of the Journal are assured that no expense possible, no labor or care, will be spared to make the Journal a welcome and useful visitor to its supporters.

The engravings for the present year are as follows: Sir Jas. Simpson, Baron Liebig, Sir William Fergusson, C. Virchow, Dupuytren, Rokitansky, Trousseau, Chelius, Civiale, Thomas King Chambers, Ricord, and Claude Bernard.

Subscribers are earnestly asked to aid in developing the material of the Journal, and to induce their friends to contribute, both by purse and pen, to its support.

The editor returns his earnest thanks to the friends and patrons of the Journal, and asks a continuance of their kindness and support.

Letters should be addressed to him at
July, '70-1y

LOUISVILLE, KENTUCKY.

ARTIFICIAL TEETH.



PRIZE MEDAL

AWARDED TO

JOHNSON & LUND,

AT THE

**WORLD'S FAIR IN PRUSSIA,
1865,**

FOR EXCELLENCE IN THE MANUFACTURE OF ARTIFICIAL TEETH

The attention of Dentists is called to our late patterns of

BLOCK TEETH FOR RUBBER BASE.

In claiming for them

BEAUTY, NATURAL APPEARANCE & TOUGHNESS,

We are endorsed by all who have given them a trial, as well as by the fact that we have just received a PRIZE MEDAL at the World's Fair in Prussia, for excellence in the manufacture of Artificial Teeth

Our assortment of Block Teeth for Rubber Base is quite varied.

PRICES.

Blocks or Sections for Rubber Base,.....	20 cents.
Single Gum Teeth, " "	20 "
" " Plate Work,.....	20 "
Plain Teeth, for Plate Work.....	10 "
" " for Rubber Work.....	10 "
Pivot Teeth,.....	8 "

NOTICE.

Our Teeth for Rubber Work have DOUBLE-HEADED PINS. These are distinct and well formed. One of them is really inserted in the tooth, the other is at the extremity of the pin, OUTSIDE. We thus secure a firm resistance in the body of the tooth, and ample space for the retention of the rubber around the pin outside. Our customers pronounce them Excelsior."

A Liberal Discount made to Wholesale Dealers.

JOHNSON & LUND.

DENTAL DEPOT.

ESTABLISHED 1869.



GIDEON SIBLEY,

MANUFACTURER OF

PORCELAIN TEETH,

AND DEALER IN

DENTISTS' MATERIALS,

921 & 923 RIDGE AVENUE,

PHILADELPHIA.

The special attention of the profession is requested to our superior quality of Teeth. We venture to say that no other make of Teeth ever attained such popularity in so short a time.

Read what the Profession say.

- "I think they are the most beautiful teeth I ever saw."
- "I have never used any teeth equal to them. I use them exclusively."
- "They are equal to any in the market. I have used no other make since I gave yours a trial."

What the Dealers say.

- "I have yet to hear of the first tooth breaking."
- "They give entire satisfaction."
- "We have heard no complaints whatever."

PRICES.

Gum Teeth,.....	12 cents each.
Five to twenty sets,.....	\$1.50 per set.
Twenty sets or more,.....	1.25 "
Plain Teeth,.....	10 cents each.
Five to twenty sets,....	\$1.30 per set.
Twenty sets or more,.....	1.18 "

GIDEON SIBLEY,
921 and 923 Ridge Avenue, Phila., Pa.

Chevalier's Dental Depot,

PERMANENTLY ESTABLISHED AT

925 BROADWAY, NEW YORK.

In my former advertisements I offered the profession a discount of fifteen per cent. on all bills exceeding a certain amount, which has met with such opposition from all the dealers in Dental Materials, that they, in consequence, refused to allow me the usual trade discount on such articles as I had to purchase from them. I am, therefore, constrained to withdraw my offer. I will, however, *continue to make a discount of fifteen per cent. on all Dental Instruments* made by my father, JOHN D. CHEVALIER, the celebrated manufacturer, on bills of *Twenty Dollars* and upwards, at the prices quoted in the Catalogue of the old firm of JOHN D. CHEVALIER & SON, except on the following articles, the prices of which are *net*:
 Chevalier's Finest Octagon Forceps, warranted for one year, each, - \$2 50
 " Excavators, Burrs & Drills, with octagon steel handles, per doz. 1 50

REPAIRING.

You have undoubtedly many instruments, such as BURRS, EXCAVATORS and PLUGGERS, which have been thrown aside as useless; many of these can be altered or repaired. Any old forcep, that is not broken at the joints, can be repaired and made as *good as new*, and the altering or repairing includes polishing. When sending instruments to be repaired, prepay the expressage, and as soon as the work is finished it will be returned to you with the bill to collect on delivery.

PRICES FOR REPAIRING:

Repairing or Altering Forceps,	- - -	each,	75 cents.
" Excavators, Burrs & Drills, with Steel Handles,	" "	"	5 "
" or Altering Pluggers,	" "	"	20 "
" " " with Ivory or Ebony	" "	"	30 "
" " " " Pearl or Cameo	" "	"	40 "
Polishing Forceps,	- - - - -	"	25 "
" Pluggers and Scalers, with Steel Handles,	" "	"	10 "
" " " Ivory or Ebony Handles,	" "	"	15 "
" " " Pearl or Cameo	" "	"	25 "

And all other repairing proportionally low.

TEETH.

I keep on hand a fine assortment of H. D. JUSTI & CO.'S celebrated Rubber and Plate Teeth. These teeth are so well and favorably known to the profession, that it is needless to offer any further recommendation for them. They are the best and cheapest in the market, the following being the prices:

GUM TEETH, Rubber and Plate, - - - each 15 cents.
PLAIN " " " " - - - " 10 "

CHEVALIER'S STANDARD LATHE.

This well-known Lathe is still before the profession, and has been reduced in price to *Twenty-one* dollars, making it the *cheapest* as well as the *best* Lathe in the market. Boxing and cartage extra.

SUNDRIES.

Rubber, Brush Wheels, Collodion, Impression Cups, Rubber Scrapers, Burrs to Chevalier's Standard and United States Lathes, and every other article required by the profession always on hand. All orders carefully filled and promptly dispatched
 By the Profession's very Obedient,

JOHN D. CHEVALIER, Jr.,

Manufactory, 120 William St.

925 Broadway, New York.

CHARLES ABBEY & SONS,

MANUFACTURERS OF

DENTISTS' FINE GOLD AND TIN FOIL,

NOS. 228 & 230 PEAR STREET,

PHILADELPHIA.

The attention of Dentists is invited to our **FINE GOLD FOIL**, which is prepared under our constant personal supervision. Our Nos. are **4, 5, 6,** and **8.**

We are also manufacturing an **ADHESIVE FINE GOLD FOIL**, Nos. **4, 5** and **6.**

ALL our Gold Foil is manufactured from **ABSOLUTELY PURE GOLD**, prepared expressly for the purpose, with great care, by ourselves.

DENTISTS' REFINED TIN FOIL CONSTANTLY ON HAND

Address

CHARLES ABBEY & SONS,

jy'69—1y

Philadelphia

WM. H. EAKINS,

MANUFACTURER OF

DENTIST'S GOLD FOIL.

—◆—
The Gold is Refined and the Foil manufactured by myself, with every care and attention.

Nos. 4, 5 & 6 CONSTANTLY ON HAND.

OTHER NUMBERS MADE TO ORDER.

ALSO,

DENTIST'S REFINED TIN FOIL,

WM. H. EAKINS,

No. 2 So. Seventh Street,

PHILADELPHIA, PA.

jy'59—1y

PHÉNOL SODIQUE.

This valuable preparation is confidently recommended to the profession as a prompt and reliable Hæmostatic, Antiseptic, Disinfectant and Astringent.

For hemorrhage following extraction it is preferred to preparations of iron, being entirely free from any escharotic or irritating qualities, and sedative and antiphlogistic in its action. It gives almost magical relief to the after-pains of extraction, and prevents subsequent soreness of the gums.

Its use is indicated : As a wash for the mouth in cases of diseased gums, aphthous conditions, and to disinfect an offensive breath ; as a gargle in throat affections, as in scarlatina, diphtheria, &c.; in foetid discharges from the ear, in ozæna, in affections of the antrum, &c., &c.

Dr. P. M. Linton says of it :

"I have at length begun to regard it as one of the professional essentials, and feel quite free to say that I know of but few articles in the whole *Materia Medica* that have a wider or more important range of application, and none perhaps that has so rarely disappointed my just and reasonable expectations. * * * I presume there are but few intelligent dentists, once becoming fairly acquainted with its many and valuable properties, who would ever after willingly consent to be without it ready at their hand."

In 8 oz. bottles, with directions,.....50 cents.

For sale by

SAMUEL S. WHITE,

jly

At Philadelphia, New York, Boston and Chicago.

BARNUM'S RUBBER DAM.

Those of the profession wishing to obtain an excellent quality of *RUBBER DAM*, can do so by sending direct to the subscriber.

Price \$1 per yard, forwarded by express, C. O. D.

N. B.—If preferred to send money by mail, *do not fail to register* the letter, as unregistered letters containing money are more than likely to be abstracted from the mail.

S. C. BARNUM, D. D. S.,

jly

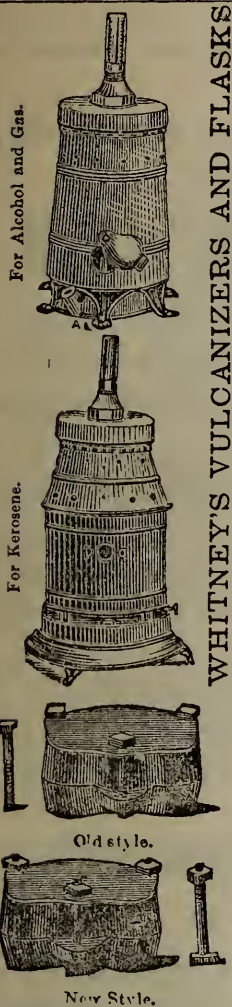
597 FIFTH AVENUE, NEW YORK.

BUFFALO DENTAL MANUFACTURING COMPANY,

Nos. 247 and 249 Main Street, Buffalo, N. Y.

MANUFACTURERS AND DEALERS IN DENTAL GOODS,

AT WHOLESALE AND RETAIL.



WHITNEY'S VULCANIZERS AND FLASKS

WHITNEY'S VULCANIZER

Is composed of two pieces only, a copper pot, and a brass head that screws on to the pot.

HAYES' VULCANIZING OVENS

Are of copper, of the usual thickness, surrounded with a shell of malleable iron, $\frac{1}{8}$ of an inch thick. The boilers are made with and without the "iron clad" shell.

Pat. Mar. 5, 1861, Apr. 3, 1866.

PRICES.

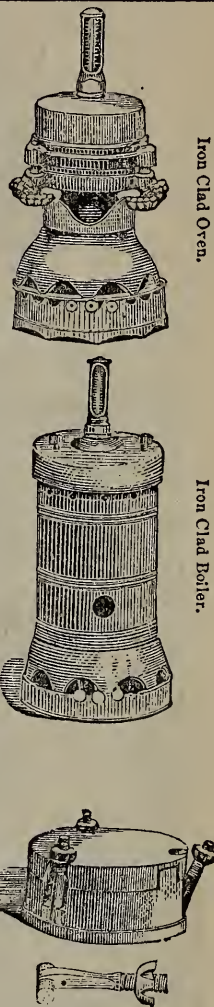
No. 1 (1 flask) Whitney's or Hayes'	\$15.00
No. 2, (2 flask) " "	16.00
No. 3, (3 flask) " "	17.00
No. 1, (1 flask) iron clad oven, Hayes'	15.00
No. 2, (2 flask) " " "	16.00
No. 2, (2 flask) " boiler, "	17.00
No. 3, (3 flask) " " "	18.00

Gas, Alcohol, or Hayes' Kerosene Burners, at above prices. Union Kerosene Stove \$1.00 extra.

PRICE OF FLASKS.

Whitney's (malleable iron)	87½ cents.
" bolts in sets of 3, ...	18 "
Hayes' flask and clamp complete, ...	87½ "
" "	37½ "
" clamp, ...	50 "

HAYES' VULCANIZERS AND FLASK.



Iron Clad Oven.

Iron Clad Boiler.

RACK FOR POINTS.

SNOW & LEWIS' IMPROVED AUTOMATIC PLUGGER.



Patented Oct. 30, and Nov. 20, 1866.

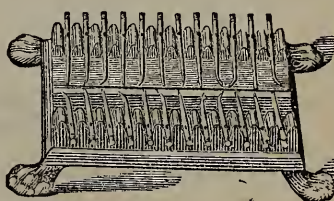
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Indeed, no more

HEALING PREPARATION

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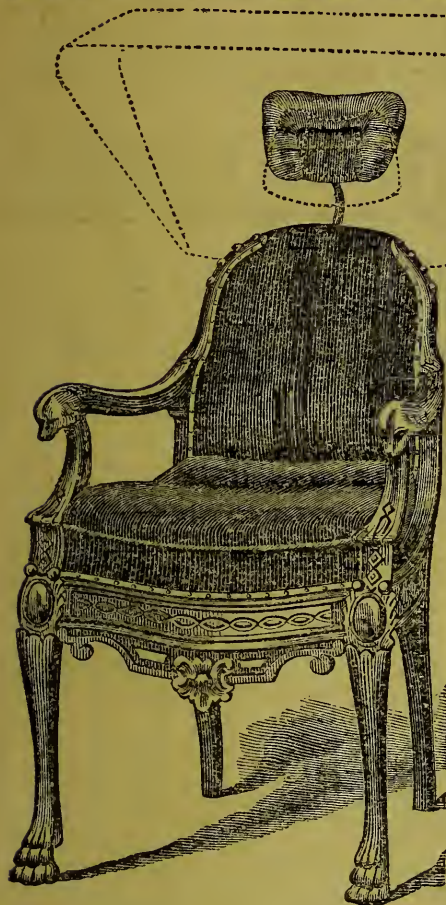
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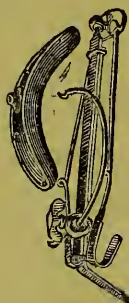
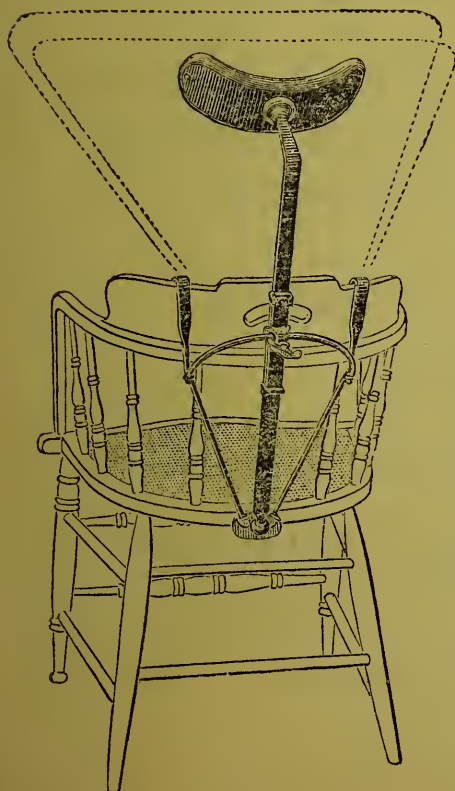
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No. 2. Bronze mountings, in other respects like No. 1,..... 25 00

No. 3. Malleable iron sheath, instead of wrought iron tube, *F*, 1-16 inch smaller rods, which are smooth finish and fine colored, mountings same as No. 2—nickel plated thumb-screws, rep upholstered,.. 15 00

No. 4. Same as No. 3, but with stationary and narrow top, a practical, efficient style,.. 10 00

No. 5. Flat gray iron slide-rods, narrow top,.. 7 00

No. 6. Price of the Portable Rest, as described, all complete,..... 10 00

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